इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”
Mazdoor Kisan Shakti Sangathan
“The Right to Information, The Right to Live”

“पुराने को छोड नये के तरफ”
Jawaharlal Nehru
“Step Out From the Old to the New”

IS 13807 (1994): Medical Radiology - Terminology [MHD 15: Electromedical Equiment]

“ज्ञान से एक नये भारत का निर्माण”
Satyanarayan Gangaram Pitroda
“Invent a New India Using Knowledge”

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”
Bhartṛhari—Nītiśatakam
“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

IS 13807 : 1994
IEC Pub 788 : 1984

(Reaffirmed 2000)

भारतीय मानक

चिकित्सा विकिरणविज्ञान – शब्दावली

Indian Standard

MEDICAL RADIOLOGY — TERMINOLOGY

(First Reprint APRIL 1995)

UDC 615'849'5 : 621'386'1 : 001'4

© BIS 1994

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH WFAR MARG
NEW DELHI 110002

May 1994

Price Group 14

Electromedical Equipment Sectional Committee, MHD 19

NATIONAL FOREWORD

This Indian Standard which is identical to IEC Pub 788 (1984) 'Medical radiology — Terminology (First Edition)', issued by the International Electrotechnical Commission (IEC) was adopted by the Bureau of Indian Standards on the recommendations of the Electromedical Equipment Sectional Committee (MHD 19) and approval of the Medical Equipment and Hospital Planning Division Council.

The text of IEC standard has been approved as suitable for publication as Indian Standard without deviations. Certain conventions are, however, not identical to those used in the Indian Standards. Attention is particularly drawn to the following:

> Wherever the words 'International Standard' or 'IEC Publication' appear referring to this standard, they should be read as 'Indian Standard'.

Only the English language text in the International Standard has been retained while adopting it in this Indian Standard.

CONTENTS

Page

Introduction 3

1

SECTION ONE
RADIOLOGICAL PHYSICS

rm-11 Ionizing radiations 4
rm-12 Interactions 5
rm-13 Quantities, units and related concepts 6

2

SECTION TWO
GENERATION AND EMISSION OF IONIZING RADIATION

rm-20 General 11
rm-21 High-voltage generators 13
rm-22 X-ray tube assemblies 14
rm-23 Particle accelerators and other high energy radiation equipment 14
rm-24 Beam therapy equipment with radionuclide sources 15
rm-25 Therapy equipment using sealed radioactive sources 15

3

SECTION THREE
RADIOLOGICAL EQUIPMENT FOR APPLICATION OF IONIZING RADIATION

rm-30 General 15
rm-31 Equipment for medical diagnostic radiology 16
rm-32 Reception, transfer and recording of the image 16
rm-33 Equipment for radiotherapy 19
rm-34 Equipment for nuclear medicine 19
rm-35 Accessories 21
rm-36 Operation of equipment 22
rm-37 Geometry of the radiation beam 25

Page

4

SECTION FOUR
MEDICAL RADIOLOGICAL TECHNIQUES

rm-40 General 27
rm-41 Diagnosis using beams 28
rm-42 Therapy using beams 29
rm-43 Nuclear medicine 30

5

SECTION FIVE
DOSIMETRY

rm-50 General 30
rm-51 Radiation detectors 30
rm-54 Phantoms 31

6

SECTION SIX
PROTECTION AGAINST IONIZING RADIATION

rm-60 General 31
rm-61 Limits and factors 31
rm-62 Groups of persons 32
rm-63 Areas 32
rm-64 Means of protection 32

7

SECTION SEVEN
TESTING OF RADIOLOGICAL EQUIPMENT

rm-71 Test equipment 33
rm-72 Verification of characteristics 33
rm-73 Mathematical, statistical and meterological concepts 33
rm-74 Standardization, obligation and statement of compliance 34

8

SECTION EIGHT
TECHNOLOGY

rm-82 Documentation 34
rm-83 Equipment 34
rm-84 Operation of equipment 35
rm-85 Persons 35
Alphabetical index 36
English terms not to be used 43
Terms to be considered instead 43
Figures 44
National Explanatory Note 49

As in the Original Standard, this Page is Intentionally Left Blank

Indian Standard

MEDICAL RADIOLOGY - TERMINOLOGY

INTRODUCTION

This Terminology Standard contains a compilation of terms and definitions as used or to be used in safety and performance standards dealing with electrical equipment in medical practice.

All concepts are concerned with medical radiology. most of them restricted to physical and technical subjects of a nature specific to medical radiology.

Some concepts of a more general nature have been assembled in Sections Seven and Eight and might disappear from a future revised edition of this Terminology Standard on medical radiology when a more comprehensive Terminology Standard for medical electrical equipment containing these concepts becomes available.

Where in this Terminology Standard a definition starts by words such as 'In RADIOTHERAPY ...' (rm-37-20) or 'For a LINEAR GRID, . . .' (rm-32-17) it is recognized that the same term might be applied in another context to a different concept. That means, in some cases it may be necessary to include an appropriate qualifier into the term or to use it with another identification.

Purely medical terms and physical or technical concepts with a more general application have been excluded, as for such concepts reference to medical, physical and technical handbooks or vocabularies should be made. However, for some of such physical and technical concepts the terms are given to ensure the consistent use of the corresponding terms in the French and English languages. Such terms (without definition) are identified bv a minus sign after their number.

Likewise only the terms in the two languages are given, where the terms are derived from a defined basic term by addition of an unambiguous qualification.

As far as possible for the purpose of this Terminology Standard, terms and definitions contained in existing publications of ICRU, ICRP, ISO, and IEC have been adopted. In particular, the following publications have been used:

ICRU Report 33,

IS0 Standard 921 : Nuclear Energy Glossary,

ICE Publication 50(391): International Electrotechnical Vocabulary (IEV), Chapter 391: Detection and Measurement of Ionizing Radiation by Electric Means.

In a restricted number of cases new terms have been adopted which may express the intended concept more clearly and which may, by deprecation of some existing terms and by new structures of interdepending concepts, avoid serious misinterpretation of the requirements and other misunderstandings.

Some terms which have been commonly used in the past and which are deprecated for the said reasons are listed at the end of the English alphabetical index, page 45, giving reference to the terms and concepts to be used instead.

Throughout this Terminology Standard synonyms have been avoided as they may constitute possible sources of confusion.

Only in a few rare cases, where the full term would impede the flow of the language out of proportion and where no misinterpretation is possible, shortened terms are recognized and contained in the alphabetical indices.

Generally, the relation between terms of interdependent concepts follows a number of logical schemes. However, in some cases, compromises had to be found where the use of certain terms appeared obligatory because of tradition.

In some sections, a sub-section headed ‘General’combines the concepts commonly applying to more than one of its sub-sections.

Wherever applicable for quantities and related quantitative concepts, the strict use of SI units is presumed when referring to this Terminology Standard.

This Terminology Standard does not claim to be exhaustive with respect to the concepts needed for the various aspects of standardization of radiological equipment and related aspects.

1 SECTION ONE

RADIOLOGICAL PHYSICS

11 11. Ionizing radiations

rm-11-01 ***Radiation***

Propagation of emitted energy through space or through a material medium in the form of waves or in the form of kinetic energy of particles.

NOTE - When unqualified, the term RADIATION usually refers

- to ELECTROMAGNETIC RADIATIONS according to frequency or origin such as:
  - RADIOFREQUENCY RADIATION
  - INFRA-RED RADIATION
  - VISIBLE RADIATION (light)
  - ULTRAVIOLET RADIATION
  - X-RADIATION
  - GAMMARADIATION
- to CORPUSCULAR RADIATIONS according to particles or origin such as:
  - ALPHA RADIATION
  - BETA RADIATION
  - ELECTRON RADIATION
  - NEUTRON RADIATION.

rm-11-02
391-02-01 ***Ionizing radiation***

RADIATION consisting of DIRECTLY or INDIRECTLY IONIZING PARTICLES or a mixture of both.

By convention ultraviolet radiation is excluded.

rm-11-03 ***Natural ionizing radiation***

IONIZING RADIATION attributable to natural sources in the terrestrial environment including those in living organisms and to extraterrestrial sources.

rm-11-04 ***Background radiation***

IONIZING RADIATION at a point, consisting Of NATURAL IONIZING RADIATION and RADIATION from man-made sources other than the RADIATION from the source under consideration.

rm-11-05
391-02-06 ***Bremsstrahlung***

X-RADIATION produced by the deceleration or the acceleration of charged particles, upon passage through the electric field of nuclei or of other charged particles.

rm-11-06 ***Primary radiation***

IONIZING RADIATION emitted directly by the TARGET or by a RADIOACTIVE SOURCE.

rm-11-07 ***Secondary radiation***

IONIZING RADIATION omitted by matter as a result of INTERACTION of PRIMARY RADIATION with that matter.

rm-11-08 ***Polyenergetic radiation***

IONIZING RADIATION consisting of photons of various RADIATION ENERGIES, or particles of one type having different kinetic energies.

Thus :

POLYENERGETIC X-RADIATION

POLYENERGETIC GAMMA RADIATION

rm-11-09 ***Monoenergetic radiation***

IONIZING RADIATION consisting of PHOTONS of nearly the same RADIATION ENERGY or of particles of one type having nearly the same kinetic energy.

rm-11-10 ***Focal radiation***

In an X-RAY SOURCE ASSEMBLY, X-RADIATION emitted from the ACTUAL FOCAL SPOT.

rm-11-11 ***Extra-focal -radiation***

In an X-RAY SOURCE ASSEMBLY, X-RADIATION emitted from the RADIATION SOURCE other than that emitted from the ACTUAL FOCALSPOT.

rm-11-12 ***Stray radiation***

For IONIZING RADIATION, all RADIATION except that of the specified RADIATION BEAM under consideration but including its RESIDUAL RADIATION.

rm-11-13 ***Scattered radiation***

IONIZING RADIATION emitted by INTERACTION OF IONIZING RADIATION with matter, the INTERACTION being accompained by a reduction in RADIATON ENERGY and/or by a change in direction of the RADIATION.

rm-11-14 ***Residual radiation***

In MEDICAL RADIOLOGY, that part of the RADIATION BEAM which remains after having passed the plane of the IMAGE RECEPTION AREA and any relevant radiation measuring device, or, in RADIOTHERAPY which emerges from the part of the body being intentionally irradiated.

rm-11-15 ***Leakage radiation***

IONIZING RADIATION which has passed through the PROTECTIVE SHIELDING of a RADIATION SOURCE as well as that which, for some types of X-RAY GENERATORS, has passed through the RADIATION APERTURE before and after LOADING (for example one containing a grid controlled X-RAY TUBE).

rm-11-16 ***Proton***

391-01-01 Stable elementary particle having a positive charge of 1·602 19 x 10^{-19} C and a REST MASS of 1·672 61 × 10^{-27} kg.

rm-11-17 ***Neutron***

391-01-02 Elementary particle having no electric charge, a REST MASS of 1.674 92 × 10^{-27} kg, and a MEAN LIFE of about 1 000 s.

rm-11-18 ***Electron***

391-01-04 Stable elementary particle having an electric charge of ±1·602 19x 10^{-19}C and a REST MASS of 9·109 56 x 10^{-31} kg.

rm-11-19 ***Photon***

391-01-05 Stable elementary particle, quantum of ELECTROMAGNETIC RADIATION.

rm-11-20 ***Directly ionizing particle***

391-01-12 Charged particle (ELECTRON, PROTON, alpha particle, etc), having sufficient kinetic energy to produce IONIZATION by collision.

rm-11-21 ***Indirectly ionizing particle***

391-01-13 Uncharged particle (NEUTRON, PHOTON, etc), which can liberate DIRECTLY IONIZING PARTICLES or can initiate a nuclear transformation.

rm-11-22 ***Radionuclide***

391-02-09 Radioactive nuclide.

12 *12.* Interactions

rm-12.01 — ***Interaction***

rm-12-02 ***Ionization***

391-04-01 Formation of ions by the division of molecules or by the addition or removal of ELECTRONS from atoms or molecules.

rm-12-03 ***Scattering***

391-04-05 Process in which a change in direction or energy of an incident particle or incident RADIATION is caused by a collision with a particle or a system of particles.

rm-12-04 ***Back-scattering***

391-04-10 SCATTERING of particles or RADIATION by material through angles greater than 90° with respect to their initial direction.

rm-12-05 ***Absorption***

rm-12-06 ***Energy absorption***

391-04-13 Phenomenon in which incident RADIATION transfers to the matter which it traverses some or all of its energy.

NOTE — SCATTERING accompanied by energy loss, for example, the Compton effect and neutron slowing down, is considered to be ENERGY ABSORPTION.

rm-12-07 ***Particle absorption***

391-04-14 Atomic or nuclear interaction in which an incident particle disappears as a free particle even when one or more of the same or different particles are subsequently emitted.

NOTE — SCATTERING is not considered to be PARTICLE ABSORPTION.

rm-12-08 ***Attenuation***

Reduction of a radiation quantity upon passage of the RADIATION through matter resulting from all types of INTERACTION with this matter. The radiation quantity may be, for example, the PARTICLE FLUX DENSITY or the ENERGY FLUX DENSITY.

NOTE — ATTENUATION does not include the geometric reduction of the radiation quantity with distance from the RADIATION SOURCE.

rm-12-09 ***Irradiation***

Exposing of a living being or matter to RADIATION.

In RADIOLOGY, exposing of a living being or matter to IONIZING RADIATION.

Thus:

X-IRRADIATION
GAMMA IRRADIATION
ELECTRON IRRADATION
NEUTRON IRRADIATION

rm-12-10 ***Transmission***

In RADIOLOGY, passage of IONIZING RADIATION through, and emergence from, matter essentially in the direction of its incidence without or after INTERACTION with that matter.

rm-12-11 ***Filtration***

Modification of characteristics of IONIZING RADIATION on passing through matter.

NOTE — FILTRATION may be:

- **preferential ABSORPTION of certain components of POLYENERGETIC X or GAMMA RADIATION accompanying its ATTENUATION.**
- **a modification of the distribution of radiation intensity over the cross-section of a RADIATION BEAM.**

rm-12-12 ***Build up***

Phenomenon of the increase with depth of the ABSORBED DOSE RATE due to the release of secondary charged particles and to SCATTERED RADIATION in matter beyond the ENTRANCE SURFACE.

rm-12-13 ***Radioactivity***
921-451

Property of certain nuclides of spontaneously emitting particles or GAMMA RADIATION or of EMITTING X-RADIATION following orbital electron capture or of undergoing spontaneous fission.

rm-12-14 ***Induced radioactivity***

RADIOACTIVITY of material caused by IRRADIATION.

rm-12-15 ***Radioactive equilibrium***

Among the members of a radioactive series, state which prevails when the ratios between the ACTIVITIES of successive members of the series remain constant.

rm-12-16 ***Secular equilibrium***

State when the ACTIVITY of a radioactive daughter is the same as the ACTIVITY of its parent and the RADIOACTIVE HALF LIFE of the parent is long compared to the period of interest of the observer.

rm-12-17 ***Luminescence***

Phenomenon in which certain substances, when excited, emit light of wavelength characteristic of the substance.

rm-12-18 ***Fluorescence***

LUMINESCENCE that occurs essentially only during excitation.

rm-12-19 ***Thermoluminescence***

LUMINESCENCE released by heating a substance previously irradiated.

rm-12-20 ***Scintillation***

In RADIOLOGY, LUMINESCENCE of short duration (of the order of a few micro-seconds or less) caused by a DIRECTLY or INDIRECTLY IONIZING PARTICLE.

rm-12-21 ***Thermionic emission***

Emission of ELECTRONS from a substance resulting from its elevated temperature.

rm-12-22 ***Cold emission***

Emission, produced by sufficiently high electric field strength, of ELECTRONS from unheated surfaces.

13 13. Quantities, units and related concepts

rm-13-01 — ***Radiation quantity***

rm-13-02 ***Particle fluence***

Letter symbol: Φ

391-03-20 At a given point of space, the number dN of particles incident during a given time interval on a suitably small sphere centred at that point divided by the cross-sectional area da of the sphere.

$$\Phi = \frac{\mathrm{d}N}{\mathrm{d}a}$$

rm-13-03

Energy fluence

391-03-23 Letter symbol: Ψ

At a given point of space, the sum of energies dE_f exclusive of REST ENERGY of all the particles incident during a given time interval on a suitably small sphere centred at that point, divided by the cross-sectional area da of that sphere.

$$\Psi = \frac{dE_f}{da}$$

rm-13-04

Part icle fluence rate

391-03-21 Letter symbol: ϕ

Increment Of **PARTICLE FLUENCE** during a suitably small interval of time dt divided by that interval of time.

$$\phi = \frac{d\Phi}{dt}$$

rm-13-05

Energy fluence rate

391-03-24 Letter symbol: $\bar{\Psi}$

Increment of **ENERGY FLUENCE** during a suitably small interval of time dt divided by that interval of time.

$$\Psi = \frac{d}{dt}$$

rm-13-06

Energy imparted

Letter symbol: ψ

Stochastic quantity of the energy imparted by ***IONIZING* RADIATION to** the matter in a volume:

$$\varepsilon = R_{in} - \text{Rout} + \Sigma Q$$

where:

R_{in} **is the incident on the volume**

R_{out} **is** the quantity of radiant energy emerging from the volume

ΣQ **is** the sum of all changes of the REST ENERGY of nuclei and elementary particles in any nuclear transformations which occur in the volume

The unit of ENERGY IMPARTED is the joule (J)

rm-13-07

Mean energy imparted

Letter symbol: $\bar{\varepsilon}$

Non-stochastic quantity of the expectation value of the ENERGY IMPARTED.

rm- 13-08

Absorbed dose

Letter symbol: D

MEAN ENERGY IMPARTED by IONIZING RADIATION to matter. ABSORBED DOSE is determined as the quotient of do by *dm*, where $d\bar{\varepsilon}$ is the **MEAN ENERGY IMPARTED** by **IONIZING RADIATION to matter** of mass dm:

$$D = \frac{d\bar{\varepsilon}}{dm}$$

The unit of **ABSORBED DOSE is the joule per kilogram ($J.kg^{-1}$). The special name of the unit of ABSORBED DOSE is the gray (Gy).**

The earlier unit of ABSORBED DOSE was the rad, 1 rad being equal to 10^{-2} $J.kg^{-1}$.

rm- 13-09

Absorbed dose rate

Letter symbol : D'

ABSORBED DOSE per unit time. **ABSORBED DOSE RATE** is determined as the quotient of dD by dt where dD is the increment of ABSORBED **DOSE** in the time interval dt:

$$D' = \frac{dD}{dt}$$

A unit of **ABSORBED DOSE RATE** is any quotient of the gray or its multiples or submultiples **by a suitable unit** of time ($Gy.s^{-1}$, $mGy.h^{-1}$, etc.).

rm-13-10

Kerma

Letter symbol: K

Kinetic energy released in material **by IONIZING RADIATION. KERMA is determined as the quotient of dE_{tr}** by dm, where dE_{tr} is the sum of the initial kinetic energies of all the charged ionizing particles liberated by uncharged ionizing particles in a material of mass dm:

$$K = \frac{dE_{tr}}{dm}$$

The unit of **KERMA** is the joule per kilogram ($J.kg^{-1}$). The special name of the unit of KERMA is the gray (GY).

The earlier unit of KERMA was the rad, 1 rad being equal 10^{-2} $J.kg^{-1}$.

rm-13-11

Air kerma

KERMA measured in a mass Of air.

rm-13-12 ***Water kerma***

KERMA measured in a mass of water.

rm-13-13 ***Kerma rate***

Letter symbol: $\dot{K}$

KERMA per unit time. KERMA rate is determined as the quotient of dK by dt, where dK is the increment of KERMA in the time interval dt:

$$\dot{K} = \frac{\mathrm{d}K}{\mathrm{d}t}$$

A unit of KERMA RATE is any quotient of the gray or its multiples or submultiples by a suitable unit of time ($\mathrm{Gy.s^{-1}}$, $\mathrm{mGy.h^{-1}}$, etc).

rm-13-14 ***Exposure***

Letter symbol: X

Electric charge produced by IONIZING RADIATION in air. EXPOSURE is determined as the quotient dQ by dm, where the value of dQ is the absolute value of the total charge of the ions of one sign produced in air when all the ELECTRONS (negatrons and positrons) liberated by PHOTONS in air of mass dm are completely stopped in air:

$$X = \frac{\mathrm{d}Q}{\mathrm{d}m}$$

The unit of EXPOSURE is the coulomb per kilogram ($\mathrm{C.kg^{-1}}$).

The earlier unit of EXPOSURE was the roentgen (R), 1 R being equal to $2.58 \times 10^{-4}\,\mathrm{C.kg^{-1}}$.

rm-13-15 ***Exposure rate***

Letter symbol: $\dot{X}$

EXPOSURE per unit time. EXPOSURE RATE is determined as the quotient of dX by dt, where dX is the increment of EXPOSURE in the time interval dt:

$$\dot{X} = \frac{\mathrm{d}X}{\mathrm{d}t}$$

A Unit Of EXPOSURE RATE is any quotient of the unit of EXPOSURE or its multiples or submultiples by a suitable unit of time ($\mathrm{C.kg^{-1}.s^{-1}}$, $\mathrm{mC.kg^{-1}.h^{-1}}$, etc).

rm-13-16 ***Area exposure product***

Product of the area of a cross-section of RADIATION BEAM and the averaged EXPOSURE over that cross-section.

rm-13-17 ***Decay constant***

391-03-06 Letter symbol : λ

For a RADIONUCLIDE, the probability for the spontaneous decay of one of its nuclei within a unit time. It is given by:

$$\lambda = -\frac{1}{N}\frac{\mathrm{d}N}{\mathrm{d}t}$$

in which N is the number of nuclei existing at time t.

rm-13-18 ***Activity***

Letter symbol: A

Quantitative indication of the RADIOACTIVITY of an amount of RADIONUCLIDE in a particular energy state at a given' time. ACTIVITY is determined as the quotient of dN by dt, where dN is the expectation value of the number of spontaneous nuclear transitions from that energy state in the time interval dt:

$$A = \frac{\mathrm{d}N}{\mathrm{d}t}$$

The unit of ACTIVITY is the reciprocal second (s-1). The special name of the unit of ACTIVITY is the becquerel (Bq), 1 Bq being equal to one transition per second.

The earlier unit of ACTIVITY was the curie (Ci), 1 Ci being equal to $3{\cdot}7 \times 10^{10}$ transitions per second.

rm-13-19 ***Specific activity***

For a RADIONUCLIDE, ACTIVITY per unit mass of that RADIONUCLIDE.

For a chemical element containing a radioactive isotope, ACTIVITY of the isotope per unit mass of the element.

For a material containing a RADIONUCLIDE, ACTIVITY per unit mass of that material.

rm-13-20 ***Radioactive half-life***

391-03-07 Letter symbol: T

For a single radioactive decay process, the time required for the ACTIVITY to decrease to half its value.

NOTE — For a RADIONUCLIDE, the RADIOACTIVE HALF LIFE T is related to the DECAY CONSTANT λ by the expression:

$$T = \frac{\ln 2}{\lambda} = \frac{0{\cdot}693}{\lambda}$$

rm-13-21 *Biological half-life*

Time required for the amount of a particular substance in a biological system to be reduced to one half of its value by biological processes when its removal follows an approximately exponential law.

rm-13-22 *Effective half-life*

Time required for the amount of a particular RADIONUCLIDE in a system to be reduced to half of its value as a consequence of both radioactive decay and other processes, such as biological elimination, when its removal follows an approximately exponential law.

rm-13-23 *Mean life*

391-03-08 Letter symbol: τ

The average lifetime of an atomic or nuclear system in a specified state.

For an exponentially decaying system, average time for the number of atoms or nuclei in a specified state to be divided by a factor e (2.718...).

NOTE-For a RADIONUCLIDE, the MEAN LIFE τ is the reciprocal of the DECAY CONSTANT λ.

$$\tau = \frac{1}{\lambda}$$

rm-13-24 *Dose equivalent*

Letter symbol: ***H***

Quantity used to express the risk of the deleterious effects of IONIZING RADIATION upon living organisms, given by the product of ***D***, Q and N, at the point of interest in tissue:

$$H = Q\,N\,D$$

where

D is the ABSORBED DOSE,

Q is the QUALITY FACTOR, and

N is the product of any other modifying factors.

The unit of DOSE EQUIVALENT is the joule per kilogram ($\mathrm{J.kg^{-1}}$). The special name of the unit of DOSE EQUIVALENT is the sievert (Sv).

The earlier unit of DOSE EQUIVALENT was the rem, 1 rem being equal to $10^{-2}\ \mathrm{J.kg^{-1}}$.

rm- 13-25 *Effective dose equivalent*

Quantity used to express the weighted DOSE EQUIVALENT to the whole body when it is irradiated non-uniformly or partially.

rm-13-26 *Dose monitor unit*

In a DOSE MONITORING SYSTEM, arbitrary unit in which a quantity is displayed and from which ABSORBED DOSE can be calculated.

rm-13-27— *Dose rate monitor unit*

rm-13-28 *Radiation quality*

Characteristic of IONIZING RADIATION determined by the spectral distribution of a radiation quantity with respect to RADIATION ENERGY.

NOTE — For various purposes concerning X-RADIATION, practical approximations of RADIATION QUALITY are expressed in terms of variables such as:

a) high voltage with PERCENTAGE RIPPLE and TOTAL FILTRATION.

b) first HALF-VALUE LAYER for specified high voltage with its PERCENTAGE RIPPLE.

c) first HALF-VALUE LAYER and TOTAL FILTRATION.

d) the first HALF-VALUE LAYER and the quotient of the first HALF-VALUE LAYER by the second HALF-VALUE LAYER.

e) EQUIVALENT ENERGY.

rm- 13-29 *Radiation energy*

In RADIOLOGY, quantity indicating the energy that a PHOTON or other particle is carrying, except its REST ENERGY.

The unit of RADIATION ENERGY is the electron volt (eV), 1 eV being equal to $1{\cdot}602\ 19 \times 10^{-19}$ J.

Thus :

X-RAY ENERGY

GAMMA RAY ENERGY

rm-13-30 *Rest mass*

Letter symbol: m_0

Mass of a particle at zero or low velocity, not augmented by relativistic mass,

rm- 13-3 1 *Rest energy*

Letter symbol: E_0

Energy corresponding to the REST MASS of a particle given by the equation:

$$E_0 = m_0 c^2$$

where

m_0 is the REST MASS, and
c is the velocity of light.

rm-13-32 *Maximum energy*

HIGHEST RADIATION ENERGY contained in a beam of POLYENERGETIC RADIATION.

rm-13-33 *Equivalent energy*

RADIATION ENERGY of MONOENERGETIC RADIATION which would have the same specified effect as the POLYENERGETIC RADIATION under consideration.

rm-13-34 *Radiation spectrum*

Distribution of a radiation quantity with respect to RADIATION ENERGY.

Thus:

X-RAY SPECTRUM

GAMMA-RAY SPECTRUM

rm-13-35 *Continuous radiation spectrum*

RADIATION SPECTRUM without pronounced discontinuities in the distribution of the specified radiation quantity over the range of RADIATION ENERGIES.

Thus:

CONTINUOUS BETA SPECTRUM

rm-13-36 *Continuous X-ray spectrum*

Continuous spectrum of X-RADIATION excluding characteristic X-RADIATIONS, having a maximum RADIATION ENERGY that is equal to the product of the electron charge and the maximum accelerating high voltage.

rm-13-37 *Attenuation equivalent*

Letter symbol: δ

Thickness of a layer of reference material which, if substituted for the material under consideration in a beam of specified RADIATION QUALITY and under specified geometrical conditions, gives the same degree of ATTENUATION.

The ATTENUATION EQUIVALENT is expressed in suitable submultiples of the metre together with the reference material and the RADIATION QUALITY of the incident beam.

rm-13-38 *Lead equivalent*

Letter symbol: δ_{Pb}

ATTENUATION EQUIVALENT expressed in thickness of lead as reference material.

NOTE — For protection against IONIZING RADIATION, it is unnecessary for a material containing a significant amount of lead to specify the RADIATION QUALITY.

rm-13-39 *Attenuation coefficient*

Letter symbol: μ

For a material in a beam of uncharged ionizing particles, quotient $\frac{dN}{N}$ by dl, where $\frac{dN}{N}$ is the fraction of particles that experience INTERACTIONS in traversing a distance dl in the material.

$$\mu = -\frac{1}{N}\frac{dN}{dl}$$

rm-13-40 *Attenuation ratio*

Ratio of the value of a specified radiation quantity in the centre of a BROAD BEAM of specified RADIATION QUALITY with the attenuating material under consideration outside the beam, to the value at the same position and under the same conditions with this attenuating material placed in the beam.

rm-13-41 *Transmission ratio*

Ratio of the value of a specified radiation quantity in the centre of a beam of specified RADIATION QUALITY and under specified geometrical conditions after passage through a material to the value which would be present at the same position without this material in the beam.

rm-13-42 *Half-value layer*

Thickness of a specified material which attenuates under NARROW BEAM CONDITIONS, X-RADIATION or GAMMA RADIATION with a particular RADIATION ENERGY or with a particular spectrum to an extent such that the KERMA RATE, EXPOSURE RATE OR ABSORBED DOSE RATE is reduced to one half of the value that is measured without the material.

The HALF VALUE LAYER is expressed in suitable submultiples of the metre together with the material.

rm-13-43 *Tenth-value layer*

Thickness of a specified material which attenuates under BROAD BEAM CONDITIONS, X-RADIATION or GAMMA RADIATION with a particular RADIATION ENERGY or with a particular spectrum to an extent such that the KERMA RATE, EXPOSURE RATE or ABSORBED DOSE RATE is reduced to one-tenth of the value that is measured without the material.

The TENTH-VALUE LAYER is expressed in suitable submultiples of the metre together with the material.

rm-13-44 *Half-value depth*

In RADIOTHERAPY, depth in tissue on the axis of a beam of specified RADIATION QUALITY and under specified geometrical conditions, at which the ABSORBED DOSE is one-half of that at a specified reference point.

rm-13-45 *Quality equivalent filtration*

Quantitative indication of the FILTRATION effected by one or several layer(s) of reference material(s) which, if substituted in a beam of specified RADIATION QUALITY under NARROW BEAM CONDITION for the material under consideration, give(s) the same RADIATION QUALITY as gives the material under consideration.

The QUALITY EQUIVALENT FILTRATION is expressed in suitable submultiples of the metre together with the reference material(s) and the RADIATION QUALITY of the incident beam.

rm-13-46 *Inherent filtration*

QUALITY EQUIVALENT FILTRATION due to the irremovable materials through which the RADIATION BEAM passes before emerging from a RADIATION SOURCE ASSEMBLY or from components thereof.

For an X-RAY TUBE ASSEMBLY, the INHERENT FILTRATION is expressed in thickness of a reference material which at specified voltage and waveform, gives the same RADIATION QUALITY in terms of first HALF-VALUE LAYER.

rm-13-47 *Additional filtration*

QUALITY EQUIVALENT filtration due to ADDED FILTERS and other removable materials in the RADIATION BEAM which are between the RADIATION SOURCE and the PATIENT or a specified plane.

rm-13-48 *Total filtration*

The total of INHERENT FILTRATION and ADDITIONAL FILTRATION.

rm-13-49 *Build-up factor*

Letter symbol: *B*

For a material irradiated, ratio of the value of a radiation quantity in the centre of a BROAD BEAM of specified RADIATION QUALITY and the corresponding value of the radiation quantity in the centre of a NARROW BEAM, both values measured in the material under consideration.

rm-13-50 *Surface dose*

ABSORBED DOSE, including that caused by BACK-SCATTERING, at a point of the ENTRANCE SURFACE of the irradiated object, usually on the RADIATION BEAM AXIS.

rm-13-51 *Depth dose*

ABSORBED DOSE at a specified depth beneath the ENTRANCE SURFACE of the irradiated object, usually on the RADIATION BEAM AXIS.

rm-13-52 *Percentage depth dose*

Ratio, expressed as a percentage of the ABSORBED DOSE at any depth to the ABSORBED DOSE at a specified point on the RADIATION BEAM AXIS.

rm-13-53 *Exit dose*

ABSORBED DOSE at a point on the surface through which the beam emerges from the irradiated object, usually on the RADIATION BEAM AXIS.

2

SECTION TWO

GENERATION AND EMISSION OF IONIZING RADIATION

20

20. General

rm-20-01 *Radiation source*

RADIOACTIVE SOURCE or part of equipment capable of emitting IONIZING RADIATION.

rm-20-02 ***Radioactive source***

Quantity of radioactive material having both an ACTIVITY and a SPECIFIC ACTIVITY above specific levels.

rm-20-03 ***Sealed radioactive source***

RADIOACTIVE SOURCE sealed in a container or having a bonded cover, the container or cover being such as to prevent contact with, and dispersion of, the radio active material under the conditions of use and wear for which it was designed.

rm-20-04 ***Unsealed radioactive source***

RADIOACTIVE SOURCE which is not a SEALED RADIOACTIVE SOURCE.

rm-20-05 ***Radiation source assembly***

Assembly of components comprising:

- — the RADIATION SOURCE,
- — the means providing protection against IONIZING RADIATION, and where applicable, against electric shock,
- — the BEAM LIMITING SYSTEM.

Thus:

X-RAY SOURCE ASSEMBLY,
GAMMA-RAY SOURCE ASSEMBLY,
RADIONUCLIDE SOURCE ASSEMBLY

rm-20-06 ***Radiation head***

Structure from which the RADIATION BEAM emerges.

rm-20-07 ***X-ray tube head***

X-RAY SOURCE ASSEMBLY containing the HIGH-VOLTAGE TRANSFORMER ASSEMBLY.

rm-20-08 ***Target***

Part of an X-RAY TUBE or PARTICLE ACCELERATOR onto which is directed a beam of accelerated particles to produce IONIZING RADIATION or other particles.

rm-20-09 ***Rejection target***

TARGET from which the beam of IONIZING RADIATION emerges through the surface struck by the beam of accelerated particles.

rm-20-10 ***Transmission target***

TARGET from which the beam of IONIZING RADIATION emerges through the surface opposite to that struck by the beam of accelerated particles.

rm-20-11 ***Target angle***

Acute angle between the plane of the ACTUAL FOCAL SPOT and the REFERENCE AXIS.

rm-20-12 ***Actual focal spot***

Area on the surface of the TARGET that intercepts the beam of accelerated particles.

rm-20-13 ***Effective focal spot***

Perpendicular projection of the ACTUAL FOCAL SPOT on the REFERENCE PLANE.

NOTE — The shortened term FOCAL SPOT refers to the EFFECTIVE FOCAL SPOT.

rm-20-14 ***Nominal focal spot value***

Dimensionless numerical value having a specific relation to the dimensions of the EFFECTIVE FOCAL SPOT of an X-RAY TUBE, measured under specific conditions.

rm-20-15 ***Blooming value***

As a characteristic of the EFFECTIVE FOCAL SPOT of an X-RAY TUBE, ratio of two resolution limits obtained under specific loading conditions.

rm-20-16 ***Capsule***

Of a SEALED RADIOACTIVE SOURCE, container in which the radioactive material is hermetically sealed for its intended use.

rm-20-17 ***X-ray generator***

Combination of all components provided for the generation and control of X-RADIATION, comprising at least the HIGH-VOLTAGE GENERATOR interconnected with an X-RAY SOURCE ASSEMBLY.

Thus:

CAPACITOR DISCHARGE X-RAY GENERATOR

rm-20-18 — ***High-voltage cable connection***

rm-20-19 ***Radiological equipment***

Equipment designed for use in RADIOLOG

rm-20-20 *X-ray equipment*

Equipment consisting of a combination of an X-RAY GENERATOR, ASSOCIATED EQUIPMENT and ACCESSORIES.

rm-20-21 *X-ray imaging arrangement*

In X-RAY EQUIPMENT, arrangement of RADIATION SOURCE and X-RAY IMAGE RECEPTOR for a specified radiological technique.

rm-20-22 *Examination room*

In MEDICAL DIAGNOSTIC RADIOLOGY, room in which IONIZING RADIATION is applied to the PATIENT or measured on the PATIENT, and which has the required structural means for RADIATION PROTECTION and for mechanical support.

rm-20-23 *Treatment room*

In RADIOTHERAPY, room in which IONIZING RADIATION is administered to the PATIENT, and which has the required structural means for RADIATION protection and for mechanical cal support.

rm-20-24 *Radiological installation*

Installed RADIOLOGICAL EQUIPMENT including all means for its intended operation.

Thus:

GAMMA-RAY INSTALLATION
X-RAY INSTALLATION

21

21. High-voltage -generators

rm-21-01 *High-voltage generator*

In an X-RAY GENERATOR, combination of all components for control and production of the electrical energy to be supplied to an X-RAY TUBE, usually consisting of a HIGH-VOLTAGE TRANSFORMER ASSEMBLY and a CONTROL ASSEMBLY.

rm-21-02 *One-peak high-voltage generator*

HIGH-VOLTAGE GENERATOR for operation on a single-phase supply that delivers an unrectified output voltage, or a rectified output voltage with one peak during each cycle of the supply.

rm-21-03 *Two-peak high-voltage generator*

HIGH-VOLTAGE GENERATOR for operation on a single-phase supply that delivers a rectified output voltage with two peaks during each cycle of the supply.

rm-21-04 *Six-peak high-voltage generator*

HIGH-VOLTAGE GENERATOR for operation on a three-phase supply that delivers a rectified output voltage with six peaks during each cycle of the supply.

rm-21-05 *Twelve-peak high-voltage generator*

HIGH-VOLTAGE GENERATOR for operation on a three phase supply that delivers a rectified output voltage with twelve peaks during each cycle of the supply.

rm-21-06 *Constant potential high-voltage generator*

HIGH-VOLTAGE GENERATOR with a PERCENTAGE RIPPLE of the output voltage not exceeding a specific value.

rm-21-07 *Stored energy high-voltage generator*

HIGH-VOLTAGE GENERATOR in which all or part of the energy to be supplied to an X-RAY TUBE is stored in an appropriate component.

rm-21-08 *Capacitor discharge high-voltage generator*

HIGH-VOLTAGE GENERATOR in which the electrical energy is stored in a high-voltage capacitor to be supplied to an X-RAY TUBE by discharge in a single LOADING.

rm-21-09 *Cascade generator*

HIGH-VOLTAGE GENERATOR including a series connection of several rectifier-capacitor pairs that produces a constant output voltage which is a multiple of the transformer voltage.

rm-21-10 *Isolated core transformer*

High-voltage transformer consisting of several isolated core segments with secondary windings, each with a rectifier and voltage doubling capacitor. The capacitors of the segments are connected in series.

rm-21-11 *Electrostatic generator*

Device producing a high voltage by electrostatic means, such as the increase of voltage with decreasing capacity of a charged capacitor.

rm-21-12 ***Van de-Graaff generator***

ELECTROSTATIC GENERATOR for the production of a high voltage by electrostatic induction and by mechanical transport of electric charges with the aid of an insulating medium.

rm-21-13 ***Impact generator***

HIGH-VOLTAGE GENERATOR consisting of several capacitors charged in parallel and discharged in series by ignition of spark gaps.

rm-21-14 ***Multiplied high-voltage generator***

HIGH-VOLTAGE GENERATOR in which the output voltage is a multiple of the output voltage of the high-voltage transformer.

rm-21-15 ***High-voltage transformer assembly***

In a HIGH-VOLTAGE GENERATOR, assembly of the high-voltage transformer and other high voltage circuit components.

22 22. X-ray tube assemblies

rm-22-01 ***X-ray tube assembly***

X-RAY TUBE housing with an X-RAY TUBE installed.

rm-22-02 ***X-ray tube housing***

Container for an X-RAY TUBE providing protection against electric shock and against X-RADIATION and having a RADIATION APERTURE. It may optionally contain additional components.

rm-22-03 ***X-ray tube***

Evacuated vessel for the production of X-RADIATION by the bombardment of a TARGET. usually contained in an ANODE, With electrons accelerated from a CATHODE by an electric field.

Thus:

ROTATING ANODE X-RAY TUBE

DOUBLE FOCUS X-RAY TUBE

rm-22-04 ***Intra-corporeal X-ray tube***

X-RAY TUBE of particular design, allowing the insertion of the FOCAL SPOT into the body through natural or artificial openings.

Thus:

INTRA-ORAL X-RAY TUBE

rm-22-05 ***Cathode***

In an X-RAY TUBE, source of the ELECTRONS.

rm-22-06 ***Anode***

In an X-RAY TUBE, electrode to which ELECTRONS forming a beam are accelerated and which usually contains the TARGET.

rm-22-07 ***Anode angle***

TARGET ANGLE in an X-RAY tube or in an X-RAY TUBE assembly.

rm-22-08 ***Focal track***

In a ROTATING ANODE X-RAY TUBE, part of the anode which is struck by the beam Of ELECTRONS during rotation of the ANODE.

rm-22-09 ***Superimposed focal spots***

TWO (Or more) EFFECTIVE FOCAL SPOTS usually of different sizes the smaller ACTUAL FOCAL SPOT falling essentially within the area of the greater one.

23 23. Particle accelerators and other high energy radiation equipment

rm-23-01 ***Particle accelerator***

Equipment for accelerating charged particles Such as ELECTRONS. PROTONS, deutrons and alpha particles to kinetic energies higher than corresponding to the voltage applied.

Thus:

ELECTRON ACCELERATOR

rm-23-02 ***Linear accelerator***

PARTICLE ACCELERATOR in which charged particles are accelerated along a straight path.

rm-23-03 ***Multistage linear accelerator***

LINEAR ACCELERATOR consisting of multiple resonators excited by a high-frequency generator in such a way that the particles arrive at successive gaps always when the field between the electrodes has the same direction and is near its maximum.

rm-23-04 ***Travelling wave linear accelerator***

LINEAR ACCELERATOR in which radio-frequency energy is applied at one end of a tube and is absorbed at the other end in such a way that particles are accelerated in a traveling electromagnetic field.

rm-23-05 *Standing wave linear accelerator*

LINEAR ACCELERATOR in which radiofrequency energy is reflected at both ends of a tube in such a way that the particles are accelerated in a standing-wave electromagnetic field.

rm-23-06 *Circular accelerator*

PARTICLE ACCELERATOR in which charged particles are guided by a magnetic field in a circular path with constant or increasing diameter.

rm-23-07 *Cyclotron*

PARTICLE ACCELERATOR in which charged particles travel in a succession of semicircular orbits of increasing radii under the influence of a constant magnetic field and are accelerated by traversing many times an electric field produced by a high-frequency generator.

rm-23-08 *Synchrotron*

PARTICLE ACCELERATOR in which charged particles travel in circular orbits of constant radius guided by an increasing magnetic field and accelerated by traversing many times an electric field produced by a high-frequency generator in synchronism. with the orbital motion.

Thus:

PROTON SYNCHROTRON

rm-23-09 Microtron

ELECTRON ACCELERATOR in which ELECTRONS are guided by a constant magnetic field in circular orbits of increasing radii tangential to each other and accelerated at the beginning of each orbit by traversing an electric field produced by a radiofrequency generator.

rm-23-10 *Betatron*

ELECTRON ACCELERATOR in which an increasing magnetic field maintains a stable orbit and electrons are accelerated by an electric field produced by the increasing magnetic flux within the orbit.

24 24. Beam therapy equipment with radionuclide sources

rm-24-01 *Radionuclide beam therapy equipment*

Thus:

GAMMA BEAM THERAPY EQUIPMENT

rm-24-02 *Shutter*

In RADIOLOGICAL EQUIPMENT, device to open or close the RADIATION APERTURE or to move the RADIATION SOURCE so as to enable of prevent the passage of a RADIATION BEAM.

rm-24-03 *Source carrier*

In equipment for RADIONUCLIDE BEAM THERAPY, component located within the RADIATION HEAD to which a CAPSULE is fixed.

25 25. Therapy equipment using sealed radioactive sources

rm-25-01 *Storage container*

Container for one or more RADIOACTIVE SOURCES, which provides protection against IONIZING RADIATION while the sources are not in use.

rm-25-02 *Channel*

In equipment for remotely controlled AFTER-LOADING, tubing in which a particular SEALED RADIOACTIVE SOURCE or assembly of SEALED RADIOACTIVE SOURCES is moved.

rm-25-03 *Source drive mechanism*

In equipment for remotely controlled AFTER-LOADING, mechanism which drives one or more SEALED RADIOACTIVE SOURCES out of, and back into, a STORAGE CONTAINER.

rm-25-04 *Source applicator*

In BRACHYRADIOTHERAPY, device to bring one or more RADIATION sources into the intended positions. A SOURCE APPLICATOR may include PROTECTIVE SHIELDING.

rm-25-05 *Extra-corporeal blood irradiator*

Equipment for therapeutic IRRADIATION of blood which is withdrawn from a PATIENT, irradiated outside the body and then returned.

3 SECTION THREE

RADIOLOGICAL EQUIPMENT FOR APPLICATION OF IONIZING RADIATION

30 30. General

rm-30-01 *Associated equipment*

In a RADIOLOGICAL INSTALLATION, equipment other than those for the production and control of IONIZING RADIATION, but essential for its application.

rm-30-02 ***Patient support***

In RADIOLOGICAL EQUIPMENT, component such as a table top or arm rest, serving to support the PATIENT in order to allow the part of his body which is to be irradiated to be positioned or to be displaced.

rm-30-03 ***Irradiation switch***

In RADIOLOGICAL EQUIPMENT, control device provided to initiate and/or stop IRRADIATION.

31

31. Equipment for medical diagnostic radiology

rm-31-01 ***...graph***

In RADIOLOGY, equipment designed to perform RADIOGRAPHY preferably by means of a specific technique.

Thus:

Tomograph (see TOMOGRAPHY)
Kymograph (see KYMOGRAPHY)

NOTE - For the specific techniques, see Sub-Section 41. The term "...graph" shall, however, not be derived from the general basic term RADIOGRAPHY or from compound terms containing this word.

rm-31-02 ***...graphic attachment***

In RADIOLOGY, ACCESSORY for an appropriate RADIOLOGICAL EQUIPMENT to perform RADIOGRAPHY by means of a specific technique.

Thus:

TOMOGRAPHIC ATTACHMENT (see TOMOGRAPHY)

rm-31-03 ***Electrokymograph***

KYMOGRAPH for obtaining the kymographic information by electronic means.

rm-31-04 Serial ***changer***

Device permitting the taking of a series of RADIOGRAMS on a single or on several RADIOGRAPHIC FILMS by means of a manually or automatically operated transport mechanism for the film or the RADIOGRAPHIC CASSETTE.

NOTE - Serial changer was earlier used as a synonym for SPOTFILM DEVICE, now it is the general concept.

rm-31-05 ***Spotfilm device***

Device for taking one or more RADIOGRAMS for which the choice of object and moment is made during RADIOSCOPY.

NOTE — A RADIOGRAPHIC CASSETTE HOLDER attached to a radioscopic device is not considered as a SPOT FILM DEVICE.

rm-31-06 ***Cassette changer***

SERIAL CHANGER in which each record is taken upon a radiographic film in a separate RADIOGRAPHIC CASSETTE.

rm-31-07 ***Film changer***

SERIAL CHANGER in which each record is taken upon a separate RADIOGRAPHIC film not contained in an individual RADIOGRAPHIC CASSETTE.

32

32. Reception, transfer and recording of the image

rm-32-01 ***X-ray pattern***

Information contained in a beam of IONIZING RADIATION, the distribution of intensity of which has been modulated by the object passed.

rm-32-02 ***Radiogram***

In RADIOLOGY, record of an X-RAY PATTERN.

rm-32-03 ***Direct radiogram***

RADIOGRAM obtained directly at the image RECEPTION AREA.

rm-32-04 ***Indirect radiogram***

RADIOGRAM obtained after transfer of the information.

rm-32-05 ***Radiological image***

Information obtained by using IONIZING RADIATION presented as an image suitable for medical diagnosis.

rm-32-06 ***Anti-scatter grid***

Device to be placed before the IMAGE RECEPTION AREA in order to reduce the incidence of SCATTERED RADIATION upon that area and thus increase the contrast in the X-RAY PATTERN.

rm-32-07 ***Linear grid***

ANTI-SCATTER GRID composed of highly absorbing strips and substantially transmitting gaps which are parallel in their longitudinal direction.

rm-32-08 *Parallel grid*

LINEAR GRID where the planes of the absorbing strips are parallel to each other and perpendicular to the incident face.

rm-32-09 *Focused grid*

LINEAR GRID where the planes of the absorbing strips converge at the focusing distance to a straight line.

rm-32-10 *Tapered grid*

LINEAR GRID in which the height of the absorbing strips decreases towards the edges perpendicularly and symmetrically to the CENTRAL LINE.

rm-32-11 *Cross grid*

ANTI-SCATTER GRID consisting of two LINEAR GRIDS built together in such a way that the directions of their absorbing strips form an angle.

rm-32-12 *Orthogonal cross grid*

CROSS GRID in which the directions of the absorbing strips form an angle of 90°.

rm-32-13 *Oblique cross grid*

CROSS GRID in which the directions of the absorbing strips form an angle other than 90°.

rm-32-14 *Stationary grid*

ANTI-SCATTER GRID used in such a way that it does not move in relation to the RADIATION BEAM.

rm-32-15 *Moving grid*

ANTI-SCATTER GRID used in such a way that during the TRANSMISSION of the RADIATION BEAM, it is moved in order to avoid the imaging of the absorbing strips and the consequent loss of information.

rm-32-16 *Strips per centimetre*

Letter symbol : N

For a LINEAR GRID, number of absorbing strips per centimetre.

rm-32-17 *Grid ratio*

Letter symbol : r

For a LINEAR GRID, ratio of the height of the strips to the width of the gaps at the CENTRAL LINE.

rm-32-18 *Focusing distance*

Letter symbol : f_0

For a FOCUSED GRID, perpendicular distance from the line into which the planes of the absorbing strips converge to the incident face of the grid.

rm-32-19 *Application limits*

Letter symbols: lower limit : f_1
upper limit : f_2

For a FOCUSED GRID, limits of the distance from the FOCAL SPOT to the incident face between which the radiological information obtained can generally be expected to be acceptable.

rm-32-20 *Central line*

On the outside of an ANTI-SCATTER GRID, marked line on the incident face indicating,

- on a LINEAR GRID:
  the direction of the absorbing strips and the centre of the effective area;
- on a FOCUSED GRID:
  the direction of the absorbing strips and the position of the strip perpendicular to the incident face;
- on a CROSS GRID:
  the same indications as above for both directions of the absorbing strips.

rm-32-21 *Transmission of primary radiation*

Letter symbol : T_p

For an ANTI-SCATTER GRID, ratio of the INDICATED VALUE of the rate of PRIMARY RADIATION with the ANTI-SCATTER GRID placed in a specified beam of RADIATION to that with the ANTI-SCATTER GRID taken out of the beam, under specific measuring conditions.

rm-32-22 *Transmission of total radiation*

Letter symbol : T_t

For an ANTI-SCATTER GRID, ratio of the INDICATED VALUE of the rate of total RADIATION with the ANTI-SCATTER GRID placed in a specified RADIATION BEAM to that with the ANTI-SCATTER GRID taken out of the beam, under specific measuring conditions.

rm-32-23 ***Transmission of scattered radiation***

Letter symbol : T_s

For an ANTI-SCATTER GRID, ratio of the INDICATED VALUE of the rate of SCATTERED RADIATION with the ANTI-SCATTER GRID in a specified RADIATION BEAM to that with the ANTI-SCATTER GRID taken out of the beam, under specific measuring conditions.

rm-32-24 ***Selectivity***

Letter symbol : Σ

For an ANTI-SCATTER GRID, ratio of the TRANSMISSION OF PRIMARY RADIATION to the TRANSMISSION OF SCATTERED RADIATION.

rm-32-25 ***Contrast improvement ratio***

Letter symbol : K

For an ANTI-SCATTER GRID, ratio of the TRANSMISSION OF PRIMARY RADIATION to the TRANSMISSION OF TOTAL RADIATION.

rm-32-26 ***Grid exposure factor***

Letter symbol : B

For an ANTI-SCATTER GRID, ratio of the INDICATED VALUE of the rate of total RADIATION without the ANTI-SCATTER GRID in a specified RADIATION BEAM to that with the ANTI-SCATTER GRID placed in the beam, under specific measuring conditions.

rm-32-27 ***Decentring of a focused grid***

Distance from the FOCAL SPOT of an X-RAY TUBE to the plane through the central line of a FOCUSED GRID and perpendicular to the incident face of the grid.

rm-32-28 ***Defocusing of a focused grid***

Difference between the distance from the FOCAL SPOT of an X-RAY TUBE to the incident face of a FOCUSED GRID and the FOCUSING DISTANCE of that grid.

rm-32-29 ***X-ray image receptor***

Device, such as a FLUORESCENT SCREEN or RADIOGRAPHIC FILM, intended to convert an X-RAY PATTERN into a visible image either directly or indirectly.

rm-32-30 ***Fluorescent screen***

Layer of a fluorescent substance on a carrier, emitting light when irradiated with IONIZING RADIATION.

rm-32-31 ***Radioscopic screen***

FLUORESCENT SCREEN used for DIRECT RADIOSCOPY.

rm-32-32 ***Radiographic film***

Sheet or roll material consisting of a transparent carrier covered with radiation-sensitive emulsion on one or usually both sides and designed for use in DIRECT RADIOGRAPHY.

rm-32-33 ***Single emulsion film***

For use in DIRECT RADIOGRAPHY, RADIOGRAPHIC FILM covered with radiation-sensitive emulsion on one side of its carrier only.

rm-32-34 ***Double emulsion film***

For use in DIRECT RADIOGRAPHY, RADIOGRAPHIC FILM covered with radiation-sensitive emulsion on both sides of its carrier.

rm-32-35 ***Non-screen film***

In DIRECT RADIOGRAPHY, RADIOGRAPHIC FILM to be used without an INTENSIFYING SCREEN.

rm-32-36 ***Screen film***

In DIRECT RADIOGRAPHY, RADIOGRAPHIC FILM with relatively high sensitivity to the RADIATION emitted by FLUORESCENCE of an INTENSIFYING SCREEN.

rm-32-37 ***Radiographic paper***

Sheet or roll material consisting of paper covered with radiation-sensitive emulsion, designed for use in DIRECT RADIOGRAPHY.

rm-32-38 ***Intensifying screen***

Layer of material used in DIRECT RADIOGRAPHY to convert the incident X-RADIATION or GAMMA RADIATION into RADIATION more suitable for the radiation-sensitive emulsion of the RADIOGRAPHIC FILM.

rm-32-39 ***X-ray image intensifier***

Device which converts an X-RAY PATTERN into a corresponding light pattern using an additional supply of energy for intensification.

rm-32-40 ***Electra-optical X-ray image intensifier***

X-RAY IMAGE INTENSIFIER incorporating an electro-optical vacuum device.

rm-32-41 ***X-ray image intensifier tube***

Electro-optical vacuumdevice with an INPUT SCREEN in Optical contact with a photocathode, in which an electron pattern is formed and then, using an additional supply of energy for intensification, converted into a light image in the OUTPUT SCREEN.

rm-32-42 ***Entrance plane***

For an ELECTRO-OPTICAL X-RAY IMAGE INTENSIFIER, plane perpendicular to its axis of symmetry and grazing the part which protrudes most in the direction of the RADIATION SOURCE.

rm-32-43 ***Entrance field size***

For an ELECTRO-OPTICAL X-RAY IMAGE INTENSIFIER, diameter of the field in the ENTRANCE PLANE that Can be used for the TRANSMISSION of an X-RAY PATTERN under specific conditions.

rm-32-44 ***Nominal entrance field size***

For an ELECTRO-OPTICAL X-RAY IMAGE INTENSIFIER, ENTRANCE FIELD SIZE that would be achieved with a parallel beam of IONIZING RADIATION.

rm-32-45 ***Luminance distribution***

In an ELECTRO-OPTICAL X-RAY IMAGE INTENSIFIER, spatial variation of luminance over the area of the OUTPUT IMAGE under specific conditions.

rm-32-46 ***Conversion factor***

In an ELECTRO-OPTICAL X-RAY IMAGE INTENSIFIER, ratio of the mean value of luminance of the OUTPUT IMAGE to the corresponding mean value of the specific radiation quantity measured in the ENTRANCE PLANE under specific conditions.

rm-32-47 ***Input screen***

In an electro-optical vacuum device, layer forming the IMAGE RECEPTION AREA.

rm-32-48 ***Output screen***

In an electro-optical vacuum device, layer in which the electron pattern is converted into a light image.

rm-32-49 ***Output image***

In an electro-optical vacuum device, light image generated in the OUTPUT SCREEN.

rm-32-50 ***X-ray television system***

Assembly of devices serving to Convert an X-RAY PATTERN, directly or indirectly, into an electronic signal which is transmitted to a display device to obtain a RADIOLOGICAL IMAGE.

33 33. Equipment for radiotherapy

rm-33-01 ***Dose monitoring system***

System of devices for the measurement and display of a radiation quantity directly related to the ABSORBED DOSE. It may include means for terminating IRRADIATION when a preselected value is reached.

rm-33-02 ***Dose rate monitoring system***

System of devices for the measurement and display of a radiation quantity directly related to the ABSORBED DOSE RATE.

rm-33-03 ***Primary dose monitoring system***

DOSE MONITORING SYSTEM which is intended to terminate IRRADIATION when a preselected value is reached.

rm-33-04 ***Secondary dose monitoring system***

DOSE MONITORING SYSTEM which is intended to terminate IRRADIATION in the event of failure of the PRIMARY DOSE MONITORING SYSTEM.

rm-33-05 ***Treatment control panel***

In RADIOTHERAPY, CONTROL PANEL from which the IRRADIATION Of PATIENTS is controlled.

34 34. Eqoipment for nuclear medicine

rm-34-01 ***Radionuclide generator***

Device, usually incorporating radiation shielding, which contains aradionuclide mixture consisting of one parent and one daughter radionuclide from which the daughter can be extracted by a simple procedure.

rm-34-02

Carrier

In NUCLEAR MEDICINE, substance in an appreciable amount which, when associated with a trace of another substance, will carry the trace with it through a chemical or physical process.

rm-34-03

Gamma camera

Equipment for SCINTIGRAPHY, which produces an image by simultaneous detection of RADIATION emitted from the object.

rm-34-04

Radionuclide scanner

Equipment for SCINTIGRAPHY, employing a single or several RADIATION DETECTOR ASSEMBLIES, in which the image is formed by moving the DETECTOR HEAD relative to the object and relating output information of the detector to the corresponding position in the RADIOLOGICAL IMAGE.

rm-34-05

Collimator

In a radionuclide imaging device, block of radiation attenuating material with one or more apertures defining the field of view and limiting the angular spread of the RADIATION that can reach the RADIATION DETECTOR ASSEMBLY.

rm-34-06

Focused collimator

COLLIMATOR with a pattern of usually equidistant apertures, the axes of which converge to a point or to a line at the GEOMETRICAL FOCAL DISTANCE.

rm-34-07

Converging collimator

FOCUSED COLLIMATOR, the GEOMETRICAL FOCAL PLANE of which lies before its entrance face.

rm-34-08

Diverging collimator

FOCUSED COLLIMATOR, the GEOMETRICAL FOCAL PLANE of which lies behind its entrance face.

rm-34-09

Detector head

ASSEMBLY of the RADIATION DETECTOR ASSEMBLY, the COLLIMATOR and the DETECTOR shield.

rm-34-10

Detector shield

Component for attenuating IONIZING RADIATION outside the ENTRANCE FIELD Of the COLLIMATOR.

rm-34-11

Radiation detector assembly

In a radionuclide imaging device, assembly with one or more RADIATION DETECTORS the electrical output signals of which are used to form a RADIOLOGICAL IMAGE.

rm-34-12

Entrance field

For a COLLIMATOR, area on the entrance face bounded by the shortest perimeter tangential to the outside edges of the peripheral apertures on its entrance face.

rm-34-13

Geometrical focal distance

For a FOCUSED COLLIMATOR, distance measured along its axis, between the entrance face and the point or line to which the axes or midplanes of its apertures converge.

rm-34-14

Effective focal distance

For a FOCUSED COLLIMATOR, distance measured along its axis, between the entrance face and the point on the axis with minimum INTRINSIC FULL WIDTH AT HALF MAXIMUM.

rm-34-15

Geometrical focal plane

For a FOCUSED COLLIMATOR, plane perpendicular to its axis at the GEOMETRICAL FOCAL DISTANCE.

rm-34-16

Effective focal plane

For a FOCUSED COLLIMATOR, plane perpendicular to its axis at the EFFECTIVE FOCAL DISTANCE.

rm-34-17

Near focal limit

For a FOCUSED COLLIMATOR, point on its axis nearest to its entrance face where the INTRINSIC FULL WIDTH AT HALF MAXIMUM is double its minimum value, or, if this point does not exist, the point of intersection of the axis of the COLLIMATOR with its entrance face.

rm-34-18

Far focal limit

For a FOCUSED COLLIMATOR, point on its axis furthest from its entrance face where the INTRINSIC FULL WIDTH AT HALF-MAXIMUM is double its minimum value.

rm-34-19

Focal depth

For a FOCUSED COLLIMATOR, distance between the FAR FOCAL LIMIT and the NEAR FOCAL LIMIT.

rm-34-20 ***True count rate***

Count rate that would be observed if the resolving time of the device were zero.

rm-34-21 ***Count rate characteristic***

Function giving the relationship between observed count rate and TRUECOUNT RATE.

rm-34-22 ***Resolving time***

Smallest time interval which must elapse between the occurrence of two consecutive input signals to a device in order that it be capable of fulfilling its function for each of them separately.

rm-34-23 ***Pulse amplitude analyzer window***

Range of input signal amplitudes for which the analyzer delivers an output signal.

rm-34-24 ***Specific plane sensitivity***

In a radionuclide imaging device with specified COLLIMATOR and PULSE AMPLITUDE ANALYZER WINDOW, ratio of the count rate of the DETECTOR HEAD to the ACTIVITY per unit area of a plane source of specific dimensions and containing a specified RADIONUCLIDE placed perpendicular to, and centred on, the’ axis of the COLLIMATOR at a specified distance from its entrance face.

rm-34-25 ***Line sensitivity***

In a radionuclide imaging device with specified COLLIMATOR and PULSE AMPLITUDE ANALYZER WINDOW, ratio of the count rate of the DETECTOR HEAD to the ACTIVITY of a line source of specific dimensions and containing a specified RADIONUCLIDE placed perpendicular to, and centred on, the axis of the COLLIMATOR at a specified distance from its entrance face.

rm-34-26 ***Non-uniformity of response***

In a radionuclide imaging device, differences in count rate between small areas of specified dimensions within the detector field of view when a uniform plane source parallel to the detector face and of dimensions larger than its entrance field is used.

rm-34-27 ***Intrinsic full width at half maximum***

In a GAMMA CAMERA, FULL WIDTH AT HALF MAXIMUM of the LINE SPREAD FUNCTION of the count rate of the RADIATION DETECTOR ASSEMBLY.

rm-34-28 ***Detector head full width at half*** maximum

In a GAMMA CAMERA, FULL WIDTH AT HALF MAXIMUM of the LINE SPREAD FUNCTION of the count rate of the DETECTOR HEAD with a specified COLLIMATOR.

rm-34-29 Intrinsic ***full width at tenth*** maximum

In a GAMMACAMERA, FULL WIDTH AT TENTH MAXIMUM of the LINE SPREAD FUNCTION of the count rate of the RADIATION DETECTOR ASSEMBLY.

rm-34-30 ***Detector head full width*** at ***tenth maximum***

In a GAMMACAMERA, FULL WIDTH AT TENTH MAXIMUM of the LINESPREAD FUNCTION of the count rate of the DETECTOR HEAD with a specified COLLIMATOR.

rm-34-31 Scale *factor*

In a radionuclide imaging device, ratio $\frac{d'}{d}$ of the distance d' between two points A’ and B’ in the recorded or displayed image to the distance d between the corresponding points A and B in a plane in the object parallel to the entrance face of the COLLIMATOR or perpendicular to its axis.

35 35. Accessories

rm-35-OI ***Filter***

In RADIOLOGICAL EQUIPMENT, material or device provided to effect FILTRATION of the RADIATION BEAM.

rm-35-02 ***Added jilter***

Removable or irremovable FILTER positioned in the RADIATION BEAM to provide part or all of the ADDITIONAL FILTRATION.

rn -35-03 ***Compound filter***

FILTER composed of more than one material.

rm-35-04 *Thoraeus filter*

COMPOUND FILTER composed of specific layers of tin, copper and aluminium in order to obtain a radiation intensity higher than would be obtained by using a FILTER of one material only giving the Same RADIATION QUALITY.

rm-35-05 *Edge filter*

FILTER whose absorption characteristic as a function of RADIATION ENERGY shows a discontinuity.

rm-35-06 *Zero filter*

In a system which includes an interlock against IRRADIATION without ADDED FILTER, means to bypass this interlock.

rm-35-07 *Field flattening filter*

FILTER used to homogenize the ABSORBED DOSE RATE over the RADIATION FIELD.

rm-35-08 *Compensating filter*

FILTER used in order to modify the distribution of ABSORBED DOSE RATE over the RADIATION FIELD.

rm-35-09 *Beam scattering filter*

FILTER used in order to scatter a beam of ELECTRONS.

rm-35-10 *Wedge filter*

FILTER which effects stepless change in TRANSMISSION over all or a part of the RADIATION FIELD.

rm-35-11 *Step filter*

FILTER which effects a stepped change in TRANSMISSION over the RADIATION FIELD.

rm-35-12 *Front pointer*

Luminous or mechanical device intended to indicate the RADIATION BEAM AXIS and its point of entry into the PATIENT.

rm-35-13 *Back pointer*

Luminous or mechanical device intended to indicate the RADIATION BEAM AXIS and its point of exit from the PATIENT.

rm-35-14 *Radiographic cassette*

Light-tight receptacle with a radiation transparent front cover, intended to house one or more stationary RADIOGRAPHIC FILMS, usually with one or more INTENSIFYING SCREENS.

rm-35-15 *Compression device*

In MEDICAL RADIOLOGY, device used to exert pressure upon a part of a PATIENT during either examination or treatment.

rm-35-16 *Tissue equivalent material*

Material which absorbs and scatters a specified IONIZING RADIATION to the same degree as a particular biological tissue.

rm-35-17 *Bolus*

TISSUE EQUIVALENT MATERIAL used in contact with the PATIENT in order to modify the distribution of ABSORBED DOSE.

rm-35-18 — *Radiographic cassette holder*

36 36. Operation of equipment

rm-36-01 *Loading factor*

Factor influencing by its value the X-RAY TUBE LOAD, for example X-RAY TUBE CURRENT, LOADING TIME, EQUIVALENT ANODE INPUT POWER, X-RAY TUBE VOLTAGE and PERCENTAGE RIPPLE.

rm-36-02 *X-ray tube voltage*

Potential difference applied to an X-RAY TUBE between the ANODE and the CATHODE.

Usually, X-RAY TUBE voltage is expressed by its peak value in kilovolts (kV).

rm-36-03 *Nominal X-ray tube voltage*

Highest permitted X-RAY TUBE VOLTAGE for specific operating conditions.

rm-36-04 *Limited X-ray tube voltage*

In an X-RAY INSTALLATION, a NOMINAL X-RAY TUBE VOLTAGE limited for a particular combination.

rm-36-05 *Initial X-ray tube voltage*

In a CAPACITOR DISCHARGE X-RAY GENERATOR, X-RAY TUBE VOLTAGE at the beginning of the LOADING of the X-RAY TUBE.

rm-36-06 *Residual X-ray tube voltage*

In a CAPACITOR DISCHARGE X-RAY GENERATOR, X-RAY TUBE VOLTAGE present at the end of the LOADING of the X-RAY TUBE.

rm-36-07 *X-ray tube current*

Electric current of the ELECTRON BEAM incident on the TARGET of an X-RAY TUBE.

Usually, the X-RAY TUBE CURRENT is expressed by its mean value in milliamperes (mA).

rm-36-08 *Filament current*

For an X-RAY TUBE, electric current applied to the filament for control of the THERMIONIC EMISSION from the CATHODE.

rm-36-09 *Loading*

In an X-RAY GENERATOR, act of supplying electrical energy to the ANODE of an X-RAY TUBE.

rm-36-10 *Loading time*

Time, determined according to a specific method, during which the ANODE INPUT POWER is applied to the X-RAY TUBE.

rm-36-11 *Irradiation time*

Duration of an IRRADIATION determined according to specific methods, usually the time a rate of a radiation quantity exceeds a specified level.

rm-36-12 *Nominal shortest irradiation time*

For HIGH-VOLTAGE GENERATORS with AUTOMATIC CONTROL SYSTEMS which vary the IRRADIATION TIME, shortest IRRADIATION TIME for which a required constancy of the controlled radiation quantity is maintained.

rm-36-13 *Current time product*

In MEDICAL RADIOLOGY, quantity of electricity resulting from the LOADING of an X-RAY TUBE expressed in milliampere seconds, as the product of the mean X-RAY TUBE CURRENT in milliamperes and the duration of the LOADING in seconds.

rm-36-14 *Reference current time product*

CURRENT TIME PRODUCT determined at a specified LOADING TIME used as a reference value to verify the linearity of LOADING FACTORS in X-RAY GENERATORS.

rm-36-15 *Proportional current time product*

In MEDICAL RADIOLOGY, quantity, expressed in milliampere seconds, proportional to the amount of IONIZING RADIATION generated by electric means from a RADIATION SOURCE.

rm-36-16 *Apparent resistance of supply mains*

For diagnostic X-RAY GENERATOR, resistance of the SUPPLY MAINS determined under specific load conditions.

rm-36-17 *Percentage ripple*

For a HIGH-VOLTAGE GENERATOR, ratio of the difference between the highest and the lowest values of a rectified voltage waveform during a cycle of the supply to the highest value, expressed as a percentage.

rm-36-18 *Percentage modulation*

For a HIGH-VOLTAGE GENERATOR, ratio of the difference between the highest and lowest values of a rectified voltage waveform during a cycle of the supply to the sum of these values, expressed as a percentage.

rm-36-19 *Nominal electric power*

For a HIGH-VOLTAGE GENERATOR, highest constant electric power which can be delivered for a single X-RAY TUBE LOAD in a specific LOADING TIME.

rm-36-20 *Cathode emission characteristic*

Dependence of the X-RAY TUBE CURRENT on variables, for example FILAMENT HEATING CURRENT, X-RAY TUBE VOLTAGE.

rm-36-21 *X-ray tube load*

Electrical energy supplied to an X-RAY TUBE expressed by a combination of values of LOADING FACTORS.

rm-36-22 *Anode input power*

Power applied to the anode of an X-RAY TUBE to produce X-RADIATION.

rm-36-23 ***Nominal anode input power***

Highest constant ANODE INPUT POWER that can be applied for a single X-RAY TUBE LOAD in a specific LOADING TIME.

rm-36-24 ***Equivalent anode input power***

Value of ANODE INPUT POWER which, if applied continuously under specified ambient conditions, would maintain a specific level of ANODE HEAD CONTENT.

rm-36-25 ***X-ray tube assembly input power***

Mean power applied to an X-RAY TUBE ASSEMBLY for all purposes before, during and after LOADING, including power applied to the stator of a ROTATING ANODE X-RAY TUBE, to the filament and to any other device included in the X-RAY TUBE ASSEMBLY.

rm-36-26 ***Anode heat content***

Momentary value of the heat contained in the ANODE of an X-RAY TUBE accumulated during, or retained after, LOADINGS.

rm-36-27 ***Maximum anode heat content***

Maximum permissible ANODE HEAT CONTENT.

rm-36-28 ***Anode heating curve***

Curve showing the ANODE HEAT CONTENT as a function of LOADING TIME for-specified ANODE INPUT POWER.

rm-36-29 ***Anode cooling curve***

Curve showing the ANODE HEAT CONTENT as a function of time with zero ANODE INPUTPOWER, beginning after a LOADING when the ANODE HEAT CONTENT is equal to the MAXIMUM ANODE HEATCONTENT.

rm-36-30 ***X-ray tube assembly heat content***

Momentary value of the heat contained in the X-RAY TUBE ASSEMBLY.

rm-36-31 ***Maximum X-ray tube assembly heat content***

Maximum permissible X-RAY TUBE ASSEMBLY HEAT CONTENT under specific ambient conditions.

rm-36-32 ***X-ray tube assembly heating curve***

Curve showing the X-RAY TUBE ASSEMBLY HEAT CONTENT as a function of LOADING TIME, under specified loading conditions.

rm-36-33 ***X-ray tube assembly cooling curve***

Curve showing the X-RAY TUBE ASSEMBLY HEAT CONTENT with zero X-RAY TUBE ASSEMBLY INPUT POWER as a function of time beginning after a LOADING when the x-ray TUBE ASSEMBLY HEAT CONTENT is equal to the MAXIMUM X-RAY TUBE ASSEMBLY HEAT CONTENT.

rm-36-34 ***Maximum continuous heat dissipation***

Highest value of the X-RAY TUBE ASSEMBLY INPUT POWER which can be applied to an X-RAY TUBE ASSEMBLY continuously under specified conditions without exceeding the MAXIMUM X-RAY TUBE ASSEMBLY HEAT CONTENT.

rm-36-35 ***Anode speed***

In a ROTATING ANODE X-RAY TUBE, angular velocity at which the ANODE rotates, usually expressed in revolutions per minute.

rm-36-36 ***Radiographic rating***

For the operation of an X-RAY TUBE, specified combination of conditions and LOADING FACTORS, under which the specified limits of loadability of the X-RAY TUBE are attained.

rm-36-37 ***Single load rating***

Highest permitted X-RAY TUBE LOAD given by a relationship between constant ANODE INPUT POWER and LOADING TIME for one LOADING under specified conditions.

rm-36-38 ***Serial load rating***

Highest permitted X-RAY TUBE LOAD given by the relationship between ANODE INPUT POWER and LOADING TIME for the total of a specified series of individual X-RAY TUBE LOADS with specified LOADING FACTORS.

rm-36-39 ***Decreasing input power rating***

Highest permitted X-RAY TUBE LOAD given as a function of LOADING TIME for single LOADINGS during which the ANODE INPUT POWER is decreased in steps or continuously.

rm-36-40 *Loading state*

For an X-RAY GENERATOR, state from the end of the READY STATE, when the intended function of the generator is initiated, until the end of the LOADING of the X-RAY TUBE.

rm-36-41 *Intermittent mode*

For an X-RAY GENERATOR, mode of loading an X-RAY TUBE where the electric energy is supplied to the tube in single, intermittent or pulsed LOADINGS, as for example in RADIOGRAPHY, CINERADIOGRAPHY.

rm-36-42 *Continuous mode*

For an X-RAY GENERATOR, mode of loading an X-RAY TUBE continuously as in RADIOTHERAPY or in RADIOSCOPY.

rm-36-43 *Continued display*

In an X-RAY EQUIPMENT, INTERMITTENT MODE in which the RADIOLOGICAL IMAGE is recorded and displayed until it is replaced by the following image.

rm-36-44 *Object programmed control*

In an X-RAY GENERATOR, mode of operation in which (a) semi-permanently pre-set combination(s) of LOADING FACTORS is (are) pre-selected depending upon the object to be irradiated, usually for diagnostic purposes.

rm 36-45 *Automatic control system*

In an X-RAY GENERATOR, system in which the control or limitation of the electric energy delivered to an X-RAY TUBE ASSEMBLY depends upon the measurement of one or more radiation quantities or corresponding physical quantities.

rm-36-46 *Automatic exposure control*

In an X-RAY GENERATOR, mode of operation in which one or more LOADING FACTORS are controlled automatically in order to obtain at a preselected location a desired quantity of RADIATION.

rm-36-47 *Automatic exposure rate control*

In an X-RAY GENERATOR, mode of operation in which the rate of emitted RADIATION is controlled automatically by control of one or more LOADING FACTORS in order to obtain at a preselected location and in a preselected LOADING TIME a desired quantity of RADIATION.

rm-36-48 *Automatic intensity control*

In an X-RAY GENERATOR, mode of operation in which one or more LOADING FACTORS are controlled automatically in order to obtain at a preselected location a desired rate of a radiation quantity.

37

37. Geometry of the radiation-beam

rm-37-01 *Virtual source*

Point from which the RADIATION appears to originate.

rm-37-02 *Reference direction*

For a RADIATION SOURCE, specified direction to which characteristics, such as TARGET ANGLE, RADIATION FIELD, and specifications with respect to the imaging quality of the RADIATION SOURCE, are referenced.

rm-37-03 *Reference axis*

For a RADIATION SOURCE, line in the REFERENCE DIRECTION through the centre of the RADIATION SOURCE.

rm-37-04 *Reference plane*

In diagnostic X-RAY EQUIPMENT for an EFFECTIVE FOCAL SPOT, plane perpendicular to the REFERENCE DIRECTION containing the point at which the REFERENCE AXIS intersects with the ACTUAL FOCAL SPOT.

By convention, the point of intersection forms the centre of the EFFECTIVE FOCAL SPOT.

rm-37-05 *Radiation beam*

In RADIOLOGY, spatial region limited in solid angle and containing a flux of IONIZING RADIATION originating from a RADIATION SOURCE that is considered as a point source.

LEAKAGE RADIATION and SCATTERED RADIATION are considered not to form a RADIATION BEAM.

Thus:

X-RAY BEAM
GAMMA-RAY BEAM
ELECTRON BEAM
NEUTRON BEAM

rm-37-06 *Radiation beam axis*

For a SYMMETRICAL RADIATION BEAM, line through the centre of the RADIATION SOURCE and half way between the effective edges of the BEAM LIMITING DEVICE.

Usually, the RADIATION BEAM AXIS coincides within required tolerances with the REFERENCE AXIS of the RADIATION SOURCE.

Thus :

X-RAY BEAM AXIS
GAMMA-RAY BEAM AXIS
NEUTRON BEAM AXIS
ELECTRON BEAM AXIS

rm-37-07 *Radiation field*

Area on a surface intersected by a RADIATION BEAM within which the radiation intensity exceeds a specific or specified level.

Thus:

X-RAY FIELD
GAMMA-RAY FIELD
ELECTRON FIELD
NEUTRON FIELD

rm-37-08 *Penumbra*

In RADIOLOGY, spatial region around the RADIATION BEAU where the value of radiation flux is between two specified or specific fractions of the value that is measured in the RADIATION BEAM AXIS, these two values being measured in a same cross-section.

NOTE — The existence of such spatial regions can be due to one or more of the following phenomena:

- EXTRA FOCAL RADIATION,
- SCATTERED RADIATION,
- absence of lateral electronic equilibrium,
- pair production,
- geometry Of the RADIATION SOURCE and of the BEAM LIMITING SYSTEM.

rm-37-09 *Light field*

In equipment emitting IONIZING RADIATION, area illuminated by light, being the locus of points at which the illumination exceeds a specific or specified level, simulating the RADIATION FIELD.

rm-37-10 *Useful object field size*

In DIAGNOSTIC RADIOLOGY, dimensions of that specific or specified cross-section in a divergent beam of IONIZING RADIATION which can be projected onto the IMAGE RECEPTION AREA.

rm-37-11 *Irradiation field size*

In RADIOTHERAPY, dimensions of an area in a plane perpendicular to the RADIATION BEAM AXIS at a specified distance from the RADIATION SOURCE or at specified depth in the irradiated object and defined by specified isodose lines.

rm-37-12 *Focal spot to skin distance*

In MEDICAL DIAGNOSTIC RADIOLOGY, distance from the REFERENCE PLANE Of an EFFECTIVE FOCAL SPOT to a plane normal to the REFERENCE DIRECTION and containing the point on the PATIENT SURFACE nearest to the RADIATION SOURCE.

In RADIOTHERAPY, distance from the REFERENCE PLANE of an EFFECTIVE FOCAL SPOT to the point at which the REFERENCE AXIS intersects with the ENTRANCE SURFACE.

rm-37-13 *Focal spot to image receptor distance*

Distance from the REFERENCE PLANE of an EFFECTIVE FOCAL SPOT to the point at which the REFERENCE AXIS intersects with the IMAGE RECEPTOR PLANE.

rm-37-14 *Radiation source to skin distance*

In RADIOTHERAPY, distance from the surface of the RADIATION SOURCE to the ENTRANCE SURFACE.

rm-37-15 *Image receptor plane*

Plane containing the greatest dimensions of the IMAGE RECEPTION AREA.

rm-37-16 *Image reception area*

In RADIOLOGY, surface on which an X-RAY PATTERN is received.

rm-37-17 ***Entrance surface***

In RADIOLOGY, plane or curved surface through which the RADIATION enters an irradiated object including any BOLUS which is present.

rm-37-18 ***Patient surface***

In RADIOLOGY, surface through which the RADIATION enters the body of the PATIENT.

rm-37-19 ***Dominant area***

In an X-RAY GENERATOR, surface of a SENSITIVE VOLUME of a device for automatic control of one or more LOADING FACTORS(S).

rm-37-20 ***Target volume***

In RADIOTHERAPY, region in the PATIENT, to which it is desired to deliver an ABSORBED DOSE.

rm-37-21 ***Treatment volume***

In RADIOTHERAPY, region in the PATIENT, to which the prescribed ABSORBED DOSE is delivered.

rm-37-22 ***Narrow beam***

RADIATION BEAM of a solid angle as small as possible for measuring a desired radiation quantity thus minimizing the contribution of SCATTERED RADIATION and ensuring, if relevant, the lateral electronic equilibrium.

rm-37-23 ***Narrow beam condition***

Arrangement for the measurement of a radiation quantity in a NARROW BEAM of IONIZING RADIATION.

rm-37-24 ***Broad beam***

RADIATION BEAM of such a solid angle that a further increase of the solid angle does not appreciably increase a measured radiation quantity, thus including the contribution of SCATTERED RADIATION.

rm-37-25 ***Broad beam condition***

Arrangement for the measurement of a radiation quantity in a BROAD BEAM Of IONIZING RADIATION.

rm-37-26 ***Radiation aperture***

Aperture in the PROTECTIVE SHIELDING of a RADIATION SOURCE or in a BEAM LIMITING DEVICE, that is intended to give passage to the RADIATION BEAM.

rm-37-27 ***Beam limiting system***

Entirety of parts and their geometrical configuration contributing to the limitation of the RADIATION BEAM.

rm-37-28 ***Beam limiting device***

Device to limit the RADIATION FIELD.

am-37-29 ***Diaphragm***

BEAM LIMITING DEVICE With either a fixed or an adjustable aperture in practically one plane.

rm-37-30 ***Beam applicator***

In MEDICAL RADIOLOGY, device usually attached to the RADIATION SOURCE ASSEMBLY performing at least one of the following functions:

- to indicate the RADIATION BEAM AXIS,
- to indicate the RADIATION FIELD,
- to ensure a minimum distance from the RADIATION SOURCE to the ENTERANCE SURFACE,
- to serve as COMPRESSION DEVICE.

NOTES

1. A BEAM APPLICATOR may include PROTECTIVE SHIELDING and serve a8 a BEAM LIMITING DEVICE.
2. As BEAM APPLICATORS may be mentioned:

pointing applicator,
open-ended applicator,
dental beam applicator,
therapeutic beam applicator.

rm-37-31 ***Light field-indicator***

In RADIOLOGICAL EQUIPMENT, device to delineate by means of visible light the extent of the field to be irradiated.

rm-37-32 ***Isocentre***

In RADIOLOGICAL EQUIPMENT with several modes of movement of the REFERENCE AXIS around a common centre, centre of the smallest sphere through which the RADIATION BEAM AXIS passes.

4 SECTION FOUR MEDICAL RADIOLOGICAL TECHNIQUES

40 40. General

rm-40-01 ***Radiology***

Science of IONIZING RADIATION and its application.

rm-40-02 ***Radiological***

Referring to IONIZING RADIATION, its generation and application for scientific, medical and technical purposes.

rm-40-03 ***Medical radiology***

Branch of RADIOLOGY applied to human and veterinary medicine as well as to dentistry and chiropractic.

rm-40-04 ***Medical diagnostic radiology***

Medical diagnosis using IONIZING RADIATION.

rm-40-05 ***Radiorherapy***

Medical therapy essentially consisting of one or more treatments by IONIZING RADIATION.

rm-40-06 ***Nuclear medicine***

Use of unsealed RADIONUCLIDES for diagnostic and therapeutic purposes.

41 41. Diagnosis using beams

rm-41-01 ***Radioscopy***

Technique for obtaining continuously or periodically a sequence of X-RAY PATTERNS and presenting them simultaneously and continuously as visible images.

rm-41-02 ***Direct radioscopy***

RADIOSCOPY in which the visible images are presented at the IMAGE RECEPTION AREA, or close to it, in the RADIATION BEAM.

rm-41-03 ***Indirect radioscopy***

RADIOSCOPY in which the images are presented after transfer of the information so that they can be viewed from outside the RADIATION BEAM.

rm-41-04 ***Stereorudioscopy***

RADIOSCOPY in which an object is irradiated from two directions to produce a pair of images which when viewed by suitable optical means give the illusion of a three-dimemsional image.

rm-41-05 ***Fluoroscopy***

Technique of RADIOSCOPY by means of a FLUORESCENT SCREEN.

rm-41-06 ***Radiography***

Technique for obtaining, recording, and optionally processing directly or after transfer, information contained in an X-RAY PATTERN at an IMAGE RECEPTION AREA.

rm-41-07 ***Direct radiography***

RADIOGRAPHY in which the recording is effected at an IMAGE RECEPTION AREA.

rm-41-08 ***Indirect radiography***

RADIOGRAPHY in which the recording is effected after transfer of the information obtained at an IMAGE RECEPTION AREA.

rm-41-09 ***Serial radiography***

RADIOGRAPHY in which the information is obtained and recorded in a regular or irregular series of LOADINGS with equal or unequal LOADING FACTORS.

rm-41-10 ***Stereoradiography***

RADIOGRAPHY in which an object is irradiated from two directions to produce a pair of RADIOGRAMS which when viewed by suitable optical means give the illusion of a three-dimensional image.

rm-41-11 ***Dental panoramic radiography***

DIRECT RADIOGRAPHY of a part of or the complete dentition by the use of an INTRA-ORAL X-RAY TUBE.

rm-41-12 ***Dental panoramic tomography***

DIRECT RADIOGRAPHY of a part or of the complete dentition by the application of a slit-diaphragm in combination with the relative motion of the X-RAY TUBE and the X-RAY IMAGE RECEPTOR.

rm-41-13 ***Kymography***

DIRECT RADIOGRAPHY in which an image of the displacements of the boundary of an object is obtained.

rm-41-14 ***Cineradiography***

INDIRECT RADIOGRAPHY of moving objects usually in rapid series on cine film.

rm-41-15 ***Tomography***

RADIOGRAPHY of one or more layers within an object.

rm-41-16 ***Direct tomography***

TOMOGRAPHY in which recording of the image of a layer in the object is effected at the IMAGE RECEPTION AREA.

rm-41-17 ***Zonography***

DIRECT TOMOGRAPHY of a relatively thick layer of an object.

rm-41-18 ***Indirect tomography***

TOMOGRAPHY in which recording of the image of a layer in the object is effected after transfer of the information obtained at the IMAGE RECEPTION AREA.

rm-41-19 ***Reconstructive tomogruphy***

TOMOGRAPHY in which information obtained from the object is recorded for constructing images of-layers in the object by processing.

rm-41-20 ***Computed tomography***

RECONSTRUCTIVE TOMOGRAPHY in which recording and processing is effected by a computing system.

rm-41-21 ***Fluorography***

INDIRECT RADIOGRAPHY by means of a FLUORESCENT SCREEN.

rm-41-22 See ***rm-41-21***

INDIRECT RADIOGRAPHY in which the recording is effected by photographing a RADIOSCOPIC SCREEN.

rm-41-23 See ***rm-41-21***

INDIRECT RADIOGRAPHY in which the recording is effected by photographing the output screen of an X-RAY IMAGE INTENSIFIER.

42 42. Therapy using beams

rm-42-01 ***Superficial radiotherapy***

RADIOTHERAPY of superficial tissues of the body usually at a depth not exceeding 1 cm.

rm-42-02 ***Deep radiotherapy***

RADIOTHERAPY in which the TARGET VOLUME is situated deep in the body, usually at a depth exceeding 1 cm, acd may be covered by healthy tissue.

rm-42-03 ***Whole body radiotherapy***

RADIOTHERAPY of practically the entire body or total skin surface.

rm-42-04 ***Intracavitary radiotherapy***

RADIOTHERAPY in which a RADIATION BEAM or one or more RADIOACTIVE SOURCES, with or without BEAM APPLICATORS or SOURCE APPLICATORS, are introduced into a body cavity through a natural or artificial opening.

rm-42-11 ***Low-voltage X-ray therapy***

RADIOTHERAPY with X-RADIATION using X-RAY TUBE VOLTAGES not exceeding 50 kV.

rm-42-12 ***X-ray therapy***

RADIOTHERAPY with X-RADIATION using X-RAY TUBE VOLTAGES up to about 300 kV.

rm-42-13 ***High-energy radiotherapy***

RADIOTHERAPY using RADIATION generated by electrical means with an EQUIVALENT ENERGY in the mega-electronvolt range.

rm-42-14 ***Radionuclide beam therapy***

RADIOTHERAPY using a beam of GAMMA RADIATION from RADIONUCLIDES contained in a RADIATION SOURCE ASSEMBLY.

rm-42-21 ***Contact X-ray therapy***

X-RAY THERAPY with a short RADIATION SOURCE TO SKIN DISTANCE, usually not more than 5 cm,

rm-42-22 ***Plesioradiotherapy***

RADIOTHERAPY using X- or GAMMA RADIATION with a medium RADIATION SOURCE TO SKIN DISTANCE, usually in the range 5 cm to 50 cm.

rm-42-23 ***Teleradiotherapy***

RADIOTHERAPY with a large RADIATION SOURCE TO SKIN DISTANCE, usually not less than 50 cm.

rm-42-31 ***Stationary radiotherapy***

RADIOTHERAPY without displacement of the RADIATION SOURCE relative to the PATIENT during the IRRADIATION.

rm-42-32 *Cross fire radiotherapy*

STATIONARY RADIOTHERAPY in which RADIATION BEAMS from different directions converge into the TARGET VOLUME.

Thus :

TANGENTIAL RADIOTHERAPY

rm-42-41 *Moving beam radiotherapy*

RADIOTHERAPY with continuous displacement of the RADIATION SOURCE relative to the PATIENT during the IRRADIATION.

rm-42-42 *Rotation radiotherapy*

MOVING BEAM RADIOTHERAPY with relative rotation around an axis.

Thus:

ECCENTRIC ROTATION RADIOTHERAPY

rm-42-43 *Pendular radiotherapy*

MOVING BEAM RADIOTHERAPY with a stationary PATIENT, in which the RADIATION SOURCE moves through, or oscillates in, an arc around an axis.

rm-42-44 *Convergent radiotherapy*

RADIOTHERAPY in which the trajectory of the RADIATION SOURCE is situated on a spherical or cylindrical surface and in which the RADIATION BEAM is directed continuously to a point.

rm-42-51 *Radionuclide contact therapy*

RADIOTHERAPY using SEALED RADIOACTIVE SOURCES in contact with (or close to) the TARGET VOLUME.

rm-42-52 *Brachyradio therapy*

INTRACAVITARY, INTERSTITIAL or SUPERFICIAL RADIOTHERAPY using one or more SEALED RADIOACTIVE SOURCES.

rm-42-53 *Interstitial radiotherapy*

RADIOTHERAPY with SEALED RADIOACTIVE SOURCES implanted within the TARGET VOLUME.

rm-42-54 *Afterloading*

Manual or remotely-controlled transfer of one or more SEALED RADIOACTIVE SOURCES between a STORAGE CONTAINER and prepositioned SOURCE APPLICATORS for BRACHYRADIOTHERAPY.

43 43. Nuclear medicine

rm-43-01 *Radiopharmaceutical therapy*

RADIOTHERAPY by means of radiopharmaceuticals.

rm-43-02 *Scintigraphy*

Technique for recording the distribution of a RADIONUCLIDE in the body.

5 SECTION FIVE
DOSIMETRY

50 50. General

rm-50-01 *Radiation meter*

391-13-01 In RADIOLOGY, assembly designed to measure quantities concerned with IONIZING RADIATION (ACTIVITY, EXPOSURE RATE, etc.), and including one or several RADIATION DETECTORS and associated sub-assemblies or basic function units.

Thus:

KERMAMETER
KERMA RATEMETER
AREA KERMA PRODUCT METER
EXPOSURE METER
EXPOSURE RATEMETER
AREA EXPOSURE PRODUCT METER

rm-50-02 *Dosemeter*

391-14-02 RADIATION METER intended to measure the ABSORBED DOSE.

rm-50-03 *Dose ratemeter*

391-14-15 RADIATION METER intended to measure or to permit evaluation of ABSORBED DOSE RATE.

51 51. Radiation detectors

rm-51-01 *Radiation detector*

391-08-01 Equipment, generally sub-assembly, or substance which, in the presence of radiation, provides by either direct or indirect means a signal or other indication suitable for use in measuring one or more quantities of the incident RADIATION.

rm-51-02 *Ionization detector*

391-08-06 RADIATION DETECTOR based on the use of IONIZATION in the SENSITIVE VOLUME of the detector.

rm-51-03 *Ionization chamber*

391-08-07 IONIZATION DETECTOR consisting of a chamber filled with a suitable gas, in which an electric field, insufficient to induce gas multiplication, is provided for the collection at the electrodes of charges associated with ions and the ELECTRONS produced in the SENSITIVE VOLUME of the detector by IONIZING RADIATION.

rm-51-04 *Transmission chamber*

IONIZATION DETECTOR Containing one or more SENSITIVE VOLUMES and suitable to transmit the entire RADIATION BEAM and which has negligible effects on the RADIATION BEAM.

rm-51-05 *Full beam detector*

RADIATION DETECTOR, the SENSITIVE VOLUME of which is irradiated by the entire RADIATION BEAM.

rm-51-06 *Comparison chamber*

IONIZATION CHAMBER used for reference purposes.

rm-51-07 *Sensitive volume*

391-10-07 Part of a detector sensitive to RADIATION and used for detection.

54 54. **Phantoms**

rm-54-01 *Phantom*

In MEDICAL RADIOLOGY, object behaving in essentially the same manner as tissue, with respect to ABSORPTION or SCATTERING of the IONIZING RADIATION in question.

PHANTOMS are used, for example, for simulating practical conditions of measurement:

- for purposes of RADIATION PROTECTION,
- for evaluating the performances of diagnostic systems with respect to the RADIATION or to the object,
- for dosimetry.

6 SECTION SIX
PROTECTION AGAINST IONIZING RADIATION

60 60. **General**

rm-60-01 *Radiation hazard*

Risk of deleterious effects to a population, to groups of persons or to particular individuals, attributed to natural or man-made RADIATION.

rm-60-02 *Radiation protection*

Limitation to an acceptable level of:

- RADIATION HAZARD,
- damage to material attributable to RADIATION.

rm-60-03 *Radiological protection*

RADIATION PROTECTION with respect to IONIZING RADIATION.

61 61. Limits and factors

rm-61-01 *Dose equivalent limit*

Value, accumulated within a stated time, of EFFECTIVE DOSE EQUIVALENT to the body or of DOSE EQUIVALENT to parts of it, other than from NATURAL IONIZING RADIATION and from IONIZING RADIATION due to medical procedures, which has been fixed as a limit for enforcement of RADIOLOGICAL PROTECTION.

rm-61-02 *Quality factor*

Letter symbol: Q

Modifying factor used for calculating DOSE EQUIVALENT at a point of interest, which accounts for the dependence on the linear collision stopping power in water of the RADIATION.

rm-61-03 *Workload*

Letter symbol: *W*

Measure in suitable units of the degree of use of equipment generating IONIZING RADIATION.

NOTE — For diagnostic X-RAY EQUIPMENT, the WORKLOAD is expressed in coulombs (C) per week in milliampere seconds (mAs) per week or milliampere minutes (mAmin) per week (1 C = 10^3 mAs = 16·66 mAmin).

Usually, the WORKLOAD is determined from the average of the weekly sums of the products of X-RAY TUBE CURRENT, and corresponding switch-on times.

For therapeutic X-RAY EQUIPMENT, WORKLOAD is expressed in KERMA per week in the RADIATION BEAM at 1 m from the source.

rm-61-04 *Orientation factor*

Letter symbol: *U*

Factor by which WORKLOAD is multiplied for calculating PROTECTIVE SHIELDING in order to take account of the time during which the RADIATION BEAM is expected to be directed to the area to be protected.

rm-61-05 Occupancy *factor*

Letter symbol: ***T***

Factor by which WORKLOAD is multiplied for calculating PROTECTIVE SHIELDING in order to take account of the degree of occupancy or type of occupants of the area to be protected.

62 62. Groups of persons

rm-62-01 ***Occupationally exposed person***

Person who, in the course of his work, may be exposed to IONIZING RADIATION above a specific level from one or more RADIATION SOURCES, excluding NATURAL IONIZING RADIATION.

rm-62-32 ***Member of the public***

For purposes of RADIOLOGICAL PROTECTION, person who is neither a PATIENT nor an OCCUPATIONALLY EXPOSED PERSON.

rm-62-03 ***Patient***

Person or animal undergoing medical examination or treatment.

For purposes of RADIOLOGICAL PROTECTION, a person or animal is a PATIENT only during the intentional application of IONIZING RADIATION to that person or animal.

63 63. Areas

rm-63-01 ***Public area***

For purposes of RADIOLOGICAL PROTECTION, an area to which the access of MEMBERS OF THE PUBLIC is not controlled.

rm-63-02 ***Monitorable public area***

PUBLIC AREA in which the effectiveness of measures for RADIOLOGICAL PROTECTION can be verified.

rm-63-03 ***Unmonitorable public area***

PUBLIC AREA to which free access for verifying the effectiveness of measures for RADIOLOGICAL PROTECTION does not or may not exist.

rm-63-04 ***Area under surveillance***

For purposes of RADIOLOGICAL PROTECTION, AREA UNDER SURVEILLANCE regarding the level of IONIZING RADIATION.

rm-63-05 ***Controlled** area*

Defined area which is part of an AREA UNDER SURVEILLANCE and for which access, occupancy and working conditions are regulated and controlled in order to protect persons against IONIZING RADIATION.

rm-63-06 ***Protected area***

Defined area within an AREA UNDER SURVEILLANCE or within a CONTROLLED AREA which is protected by STRUCTURAL SHIELDING or by distance so that the level of RADIATION is lower than is required for the total area of which it is a part.

1-m-63-07 ***Significant zone of occupancy***

For X-RAY EQUIPMENT, zone with specified boundaries within an AREA UNDER SURVEILLANCE or within a CONTROLLED AREA, other than a PROTECTED AREA, that is significant because of the assumed need for persons to occupy it during IRRADIATION.

64 64. Means of protection

rm-64-01 ***Protective shielding***

In RADIOLOGY, material that limits the extent of the RADIATION BEAM or attenuates STRAY RADIATION.

NOTE - PROTECTIVE SHIELDING may include materials provided for RADIOLOGICAL PROTECTION, or devices or materials provided for other purposes, which attenuate IONIZING RADIATION.

1-m-64-02 ***Primary protective sheilding***

PROTECTIVE SHIELDING for attenuating RESIDUAL RADIATION

rm-64-03 ***Structural shielding***

PROTECTIVE SHIELDING forming part of the building structure of a RADIOLOGICAL INSTALLATION.

rm-64-04 ***Protective barrier***

PROTECTIVE SHIELDING in the form of attenuating material provided for RADIOLOGICAL PROTECTION.

rm-64-05 ***Protective device***

In RADIOLOGY, device for the purpose of RADIOLOGICAL PROTECTION.

Thus:

- PROTECTIVE CLOTHING
- PROTECTIVE APRON
- PROTECTIVE SKIRT
- PROTECTIVE GLOVE
- Mobile PROTECTIVE BARRIER

rm-64-06 *Scrotum shield*

PROTECTIVE DEVICE intended to protect by enclosure the gonads of a male PATIENT.,

rm-64-07 *Ovary shield*

PROTECTIVE DEVICE intended to Protect the gonads of a female PATIENT.

rm-64-08 *Personal dasemeter*

391-14-03 DOSEMETER of small size intended to be carried by a person in order to determine the ABSORBED DOSE received by this person.

7 SECTION SEVEN
TESTING OF RADIOLOGICAL EQUIPMENT

71 71. Test equipment

rm-71-01 *Slit camera*

Assembly of equipment used to obtain a FOCAL SPOT SLIT RADIOGRAM on RADIOGRAPHIC FILM.

rm-71-02 *Pinhole camera*

Assembly of equipment used to obtain a FOCAL SPOT PINHOLE RADIOGRAM on RADIOGRAPHIC FILM.

rm-71-03 *Star pattern camera*

Assembly of equipment used to obtain a FOCAL SPOT STAR RADIOGRAM on RADIOGRAPHIC FILM.

rm-71-04 *Test device*

For tests requiring an X-RAY PATTERN, specific structure of one or more suitable materials to be placed in a RADIATION BEAM in order to produce such a pattern.

72 72. Verification of characteristics

rm-72-01 *Focal spot slit radiogram*

RADIOGRAM obtained by means of a SLIT CAMERA, showing the distribution, across an EFFECTIVE FOCAL SPOT, in the direction normal to the length of the slit, of the intensity Of the RADIATION emitted.

rm-72-02 *Focal spot pinhole radiogram*

RADIOGRAM obtained by means of a PINHOLE CAMERA, showing the shape and orientation of an EFFECTIVE FOCAL SPOT, and the spatial distribution of intensity Of RADIATION across it.

rm-72-03 *Focal spot star radiogram*

RADIOGRAM obtained by means of a STAR PATTERN CAMERA for the determination of the star pattern, resolution limit in one or more directions across an EFFECTIVE FOCAL SPOT.

73 73. Mathematical, statistical and metrological concepts

rm-73-01 *Line spread function*

Letter symbol: L

In an imaging system, distribution of the intensity from a line source along a straight line in a specified image plane where the straight line is normal to the image of the line source.

rm-73-02 *Full width at half maximum*

For a bell shaped curve, distance parallel to the abscissa axis between the points where the ordinate has half of its maximum value.

rm-73-03 *Full width at tenth maximum*

For a bell shaped curve, distance parallel to the abscissa axis between the points where the ordinate has one tenth of its maximum value.

rm-73-04 *Modulation*

(See also rm-36-18 Percentage modulation)

Quotient of the difference between the highest and the lowest values and the sum of these values of a quantity that varies periodically and does not change sign.

rm-73-05 *Modulation transfer function*

Letter symbol: M

Fourier transform of the LINE SPREAD FUNCTION.

For a symmetrical LINE SPREAD FUNCTION, the MODULATION TRANSFER FUNCTION is the normalized Fourier transform using the equation:

$$M(v) = \frac{\int_{-\infty}^{+\infty} L(x) \cos 2\pi\, vx\mathrm{d}x}{\int_{-\infty}^{+\infty} L(x)\, x\mathrm{d}x}$$

where:

v is the spatial frequency,

L is the LINE SPREAD FUNCTION,

x is the abscissa.

rm-73-06 *Error of Measurement*

Difference between the MEASURED VALUE of a quantity and the TRUE VALUE of that quantity.

rm-73-07 *True value*

Value of the physical quantity to be measured by an instrument.

rm-73-08 *Measured value*

Estimate of the TRUE VALUE of a quantity, derived from the INDICATED VALUE of a meter after applying all relevant correction factors.

rm-73-09 *Scale reading*

Value displayed by an instrument before applying scale factors.

rm-73-10 *Indicated value*

Value of a quantity derived from the SCALE READING of an instrument after applying scale factors.

74 74. Standardization, obligation and statement of compliance

rm-74-01 *Specific*

When used in combination with parameters or conditions: referring to a particular value or standardized arrangement, usually to those required in an IEC standard or a legal requirement.

rm-74-02 *Specified*

When used in combination with parameters or conditions: referring to a value or arrangement to be chosen for the purpose under consideration and indicated usually in ACCOMPANYING DOCUMENTS.

8 SECTION EIGHT
TECHNOLOGY

82 82. Documentation

rm-82-01 *Accompanying documents*

Documents provided with an installation, equipment, ASSOCIATED EQUIPMENT, or ACCESSORY and containing important information for the assembler, installer and USER, particularly regarding safety.

rm-82-02 *Instructions for use*

Those parts of ACCOMPANYING DOCUMENTS giving the necessary information for safe and proper use and operation of the equipment.

rm-82-03 *Assembling Instructions*

Those parts of ACCOMPANYING DOCUMENTS giving information enabling an assembler to observe necessary precautions with respect to safety and functional performance when assembling equipment, equipment parts or sub-assemblies according to their specified purpose.

rm-82-04 *Normal use*

Use and operation, as well as transport and storage between periods of use, according to the INSTRUCTIONS FOR USE or for the obvious intended purpose.

83 83. Equipment

rm-83-01 *Control assembly*

Combination of devices necessary for preselection, control, measurement, regulation and indication of relevant operating factors of equipment.

rm-83-02 *Control panel*

Part of equipment in which one or more mannually operated devices are mounted for the purpose of controlling all, or some of the functions of the equipment.

The CONTROL PANEL may contain devices for indicating and displaying operating factors.

rm-83-03 *Timing device*

Device integrating and/or presenting time intervals elapsed during an equipment function and optionally changing the state of operation at the end of a predetermined time interval.

rm-83-04 ***Controlling timer***

TIMING DEVICE changing a state of operation at the end of a predetermined time interval or of a predetermined total time that may consist of separate time intervals.

rm-83-05 ***Interlock***

Device preventing the start or the continued operation of equipment unless certain predetermined conditions prevail.

rm-83-06 ***Accessory***

Additional component for use with an equipment in order:

- to perform its intended use,
- to adapt the equipment to some special use,
- to facilitate the use of the equipment,
- to enhance the performance of the equipment,
- to enable the functions of the equipment to be integrated with those of other equipment.

84 84. Operation of equipment

rm-84-01 ***Display***

Visual presentation of information.

rm-84-02 ***Transfer***

Displacement of information optionally including its transformation or conversion.

rm-84-03 ***Stand-by state***

State of equipment after a preconditioning which is indispensable or customary, before the intended operation of such equipment can be initiated.

rm-84-04 ***Preparatory state***

State of equipment for setting essential operating conditions, if in the STAND-BY STATE, the setting of these conditions is not possible.

rm-84-05 ***Ready state***

State of equipment, in which all conditions. such as carrying out of confirming operations and any other satisfaction of INTERLOCKS are prevailing so that the intended operation of such equipment can be initiated by a single action.

rm-84-06 ***Monitoring***

Measurement of pertinent functional values or collection of other appropriate information for the purpose of maintaining proper and safe conditions.

rm-84-07 ***Accessible surface***

Surface of equipment or of an equipment part that can be easily or accidentally touched by persons without the use of a tool.

85 85. Persons

rm-85-01 *User*

When used in an IEC standard on electromedical equipment, organization or individual responsible for the use and maintenance of the equipment.

rm-85-02 ***Operator***

Person utilizing an equipment individually with or without the aid of an assistant, who controls some or all functions of the equipment in his presence.

rm-85-03 — ***Manufacturer***

ALPHABETICAL INDEX

Name of unit in the International System SI .... rm-...-...*
Derived term without definition .... rm-...-...+
Term without definition .... rm-...-...—
Name of earlier unit .... rm-...-...●
Shortened term .... rm-...-...s

Name of unit in the International System SI rm-...-...*
Derived term without definition .... rm-...-...+
Term without definition .... rm-...-...—
Name of earlier unit .... rm-...-... .
Shortened term .... rm-...-... s

Absorbed dose rm-13-08
Absorbed dose rate rm-13-09
Absorption .... rm-12-05—
Absorption, Energy rm-12-06
Absorption, Particle rm-12-07
Accessible surface rm-84-07
Accessory rm-83-06
Accompanying documents rm-82-01
Activity rm-13-18
Actual focal spot rm-20-12
Added filter rm-35-02
Additional filtration rm-13-47
Afterloading rm-42-54
Air kerma rm-13-11
Alpha radiation .... rm-11-01 --
Anode rm-22-06
Anode angle rm-22-07
Anode cooling curve rm-36-29
Anode heat content rm-36-26
Anode heating curve rm-36-28
Anode input power rm-36-22
Anode speed rm-36-35
Anti-scatter grid rm-32-06
Apparent resistance of supply mains rm-36-16
Application limits rm-32-19
Area exposure product rm-13-16
Area exposure product meter .... rm-50-01 +
Area kerma product meter .... rm-50-01 +
Area under surveillance rm-63-04
Assembling instructions rm-82-03
Associated equipment rm-30-01
Attenuation rm-12-08
Attenuation coefficient rm-13-39
Attenuation equivalent rm-13-37
Attenuation ratio rm-13-40
Automatic control system rm-36-45
Automatic exposure control rm-36-46
Automatic exposure rate control rm-36-17
Automatic intensity control rm-36-48

Back pointer rm-35-13
Back-scattering rm-12-04
Background radiation rm-11-04
Beam applicator rm-37-30
Beam limiting device rm-37-28
Beam limiting system rm-37-27
Beam scattering filter rm-35-09
Becquerel rm-13-18*
Beta radiation .... rm-11-01 —
Betatron rm-23-10
Biological half-life rm-13-21
Blooming value rm-20-15
Bolus rm-35-17
Brachyradiotherapy rm-42-52
Bremsstrahlung rm-11-05
Broad beam rm-37-24
Broad beam condition rm-37-25
Build up rm-12-12
Build up factor rm-13-49

Capacitor discharge high-voltage generator rm-21-08
Capacitor discharge X-ray generator .... rm-20-17+
Capsule rm-20-16
Carrier rm-34-02
Cascade generator rm-21-09
Cassette changer rm-31-06
Cathode rm-22-05
Cathode emission characteristic rm-36-20
Central line rm-32-20
Channel rm-25-02
Cineradiography rm-41-14
Circular accelerator rm-23-06
Cold emission rm-12-22
Collimator rm-34-05
Comparison chamber rm-51-06
Compensating filter rm-35-08
Compound filter rm-35-03
Compression device rm-35-15
Computed tomography rm-41-20
Constant potential high-voltage generator rm-21-06
Contact X-ray therapy rm-42-21
Continued display rm-36-43
Continuous beta spectrum .... rm-13-35+
Continuous mode rm-36-42
Continuous radiation spectrum rm-13-35
Continuous X-ray spectrum rm-13-36
Contrast improvement ratio rm-32-25
Control assembly rm-83-01

Name of unit in the International System SI	rm-...-...*
Derived term without definition	rm-...-...+
Term without definition	rm-...-...—
Name of earlier unit	rm-...-....
Shortened term	rm-...-...s

Control panel	rm-83-02
Controlled area	rm-63-05
Controlling timer	rm-83-04
Convergent radiotherapy	rm-42-44
Converging collimator	rm-34-07
Conversion factor	rm-32-46
Corpuscular radiation	rm-11-01—
Count rate characteristic	rm-34-21
Cross fire radiotherapy	rm-42-32
Cross grid	rm-32-11
Curie	rm-13-18 ●
Current time product	rm-36-13
Cyclotron	rm-23-07
Decay constant	rm-13-17
Decentring of a focused grid	rm-32-27
Decreasing input power rating	rm-36-39
Deep radiotherapy	rm-42-02
Defocusing of a focused grid	rm-32-28
Dental beam applicator	rm-37-30 +
Dental panoramic radiography	rm-41-11
Dental panoramic tomography	rm-41-12
Depth dose	rm-13-51
Detector head	rm-34-09
Detector head full width at half maximum	rm-34-28
Detector head full width at tenth maximum	rm-34-30
Detector shield	rm-34-10
Diaphragm	rm-37-29
Direct radiogram	rm-32-03
Direct radiography	rm-41-07
Direct radioscopy	rm-41-02
Direct tomography	rm-41-16
Directly ionizing particle	rm-11-20
Display	rm-84-01
Diverging collimator	rm-34-08
Dominant area	rm-37-19
Dose equivalent	rm-13-24
Dose equivalent limit	rm-61-01
Dose monitor unit	rm-13-26
Dose monitoring system	rm-33-01
Dose rate monitor unit	rm-13-27—
Dose rate monitoring system	rm-33-02
Dose ratemeter	rm-50-03
Dosemeter	rm-50-02

Name of unit in the International System SI	rm-...-...*
Derived term without definition	rm-...-...+
Term without definition	rm-...-...—
Name of earlier unit	rm-...-....
Shortened term	rm-...-...s

Double emulsion film	rm-32-34
Double focus X-ray tube	rm-22-03 +
Eccentric rotation radiotherapy	rm-42-42+
Edge filter	rm-35-05
Effective dose equivalent	rm-13-25
Effective focal distance	rm-34-14
Effective focal plane	rm-34-16
Effective focal spot	rm-20-13
Effective half-life	rm-13-22
Electra-optical X-ray image intensifier	rm-32-40
Electrokymograph	rm-31-03
Electromagnetic radiation	rm-11-01—
Electron	rm-11-18
Electron accelerator	rm-23-01+
Electron beam	rm-37-05+
Electron beam axis	rm-37-06 +
Electron field	rm-37-07 +
Electron irradiation	rm-12-09 +
Electron radiation	rm-11-01—
Electronvolt, see also : rm-11-18	rm-13-29*
Electrostatic generator	rm-21-11
Energy absorption	rm-12-06
Energy fluence	rm-13-03
Energy fluence rate	rm-13-05
Energy imparted	rm-13-06
Entrance field	rm-34-12
Entrance field size	rm-32-43
Entrance plane	rm-32-42
Entrance surface	rm-37-17
Equivalent anode input power	rm-36-24
Equivalent energy	rm-13-33
Error of measurement	rm-73-06
Examination room	rm-20-22
Exit dose	rm-13-53
Exposure	rm-13-14
Exposure meter	rm-50-01+
Exposure rate	rm-13-15
Exposure ratemeter	rm-50-01 +
Extra-corporeal blood irradiator	rm-25-05
Extra-focal radiation	rm-11-11
Far focal limit	rm-34-18
Field flattening filter	rm-35-07
Filament current	rm-36-08
Film changer	rm-31-07
Filter	rm-35-01

Name of unit in the International System SI rm-...-....*
Derived term without definition .... rm-...-...+
Term without definition .... rm-...-...—
Name of earlier unit.......................... rm-...-...●
Shortened term .... rm-...-...s

Filtration rm-12-11
Fluorescence.. .... rm-12-18
Fluorescent screen rm-32-30
Fluorography rm-41-21
Fluoroscopy rm-41-05
Focal depth rm-34-19
Focal radiation.......................... rm-11-10
Focal spot rm-20-13s
Focal spot pinhole radiogram rm-72-02
Focal spot slit radingram rm-72-01
Focal spot star radiogram rm-72-03
Focal spot to image receptor distance rm-37-13
Focal spot to skin distance rm-37-12
Focal track rm-22-08
Focused collimator.................... rm-34-06
Focused grid............................ rm-32-09
Focusing distance rm-32-18
Front pointer rm-35-12
Full beam detector rm-51-05
Full width at half maximum......... rm-73-02
Full width at tenth maximum rm-73-03

Gamma beam therapy equipment... rm-24-01 +
Gamma camera rm-34-03
Gamma irradiation .... rm-12-09 +
Gamma radiation...................... rm-11-01-
Gamma-ray beam .... rm-37-05 +
Gamma-ray beam axis .... rm-37-06 +
Gamma-ray field .... rm-37-07 +
Gamma-ray installation.............. rm-20-24 +
Gamma-ray source assembly........ rm-20-05 +
Gamma-ray spectrum .... rm-13-34 +
Geometrical focal distance rm-34-13
Gometrical focal plane rm-34-15
graph, ... rm-31-01
graphic,... attachment.. .... rm-31-02
Gray rm-13-08*
Gray .... rm-13-10”
Grid exposure factor rm-32-26
Grid ratio rm-32-17

Half-value depth rm-13-44
Half-value layer rm-13-42
High-energy radiotherapy rm-42-13
High-voltage cable connection...... rm-20-18—
High-voltage generator rm-21-01
High-voltage transformer assembly rm-21-15

Name of unit in the International System SI rm-...-....*
Derived term without definition .... rm-...-...+
Term without definition .... rm-...-...—
Name of earlier unit........................... rm-...-. . . .
Shortened term .... rm-.......s

Image reception area rm-37-16
Image receptor plane rm-37-15
Impact generator rm-21-13
Indicated value.......................... rm-73-10
Indirect radiogram...................... rm-32-04
Indirect radiography rm-41-08
Indirect radioscopy..................... rm-41-03
Indirect tomography rm-ill-18
Indirectly ionizing particle rm-11-21
Induced radioactivity rm-12-14
Infra-red radiation .... rm-11-01—
Inherent filtration rm-13-46
Initial X-ray tube voltage rm-36-05
Input screen rm-32-47
Instructions-for use... .... rm-82-02
Intensifying screen rm-32-38
Interaction............................... rm-12-01—
Interlock rm-83-05
Intermittent mode rm-36-41
Interstitial radiotherapy.. .... rm-42-53
Intra-corporeal X-ray tube........... rm-22-04
Intra-oral X-ray tube .... rm-22-04 +
Intracavitary radiotherapy.. .... rm-42-04
Intrinsic full width at half maximum rm-34-27
Intrinsic full width at tenth maximum rm-34-29
Ionization rm-12-02
Ionization chamber..................... rm-51-03
Ionization detector rm-51-02
Ionizing radiation rm-11-02
Irradiation................................ rm-12-09
Irradiation field size rm-37-11
Irradiation switch rm-30-03
Irradiation time rm-36-11
Isocentre rm-37-32
Isolated core transformer rm-21-10

Kerma...................................... rm-13-10
Kemra rate rm-13-13
Kerma ratemeter........................ rm-50-01 +
Kermameter .... rm-50-01 +
Kymograph .... rm-31-01 +
Kymography rm-41-13
Lead equivalent rm-13-38
Leakage radiation rm-11-15
Light field rm-Y-09
Light field-indicator rm-37-31
Limited X-ray tube voltage rm-36-04

Name of unit in the International System SI rm-...-...*
Derived term without definition .... rm-...-...+
Term without definition .... rm-...-...—
Name of earlier unit .... rm-.......
Shortened term .... rm-...-...s

Line sensitivity.. .... rm-34-25
Line spread function rm-73-01
Linear accelerator rm-23-02
Linear grid rm-32-07
Loading rm-36-09
Loading factor.......................... rm-36-01
Loading state rm-36-40
Loading time rm-36-10
Low-voltage X-ray therapy rm-42-11
Luminance distribution rm-32-45
Luminescence rm-12-17
Manufacturer .... rm-85-03—
Maximum anode heat content...... rm-36-27
Maximum continuous heat dissipation rm-36-34
Maximum energy....................... rm-13-32
Maximum X-ray tube assembly heat content rm-36-31
Mean energy imparted rm-13-07
Mean life rm-13-23
Measured value rm-73-08
Medical diagnostic radiology rm-40-04
Medical radiology rm-40-03
Member of the public................ rm-62-02
Microtron rm-23-09
Modulation rm-73-04
Modulation transfer function rm-73-05
Monitorable public area.............. rm-63-02
Monitoring rm-84-06
Monoenergetic radiation rm-11-09
Moving beam radiotherapy rm-42-41
Moving grid rm-32-15
Multiplied high-voltage generator rm-21-14
Multistage linear accelerator rm-23-03
Narrow beam rm-37-22
Narrow beam condition.............. rm-37-23
Natural ionizing radiation.. .... rm-11-03
Near focal limit rm-34-17
Neutron rm-11-17
Neutron beam .... rm-37-05 +
Neutron beam axis rm-37-06
Neutron field .... rm-37-07 +
Neutron irradiation .... rm-12-09+
Neutron radiation .... rm-11-01—
Nominal anode input power rm-36-23
Nominal electric power............... rm-36-19

Name of unit in the International System SI rm-...-...*
Derived term without definition .... rm-...-...+
Term without definition .... rm-...-...—
Name of earlier unit .... rm-...-...●
Shortened term .... rm-...-...s

Nominal entrance field size rm-32-44
Nominal focal spot value rm-20-14
Nominal shortest irradiation time rm-36-12
Nominal X-ray tube voltage rm-36-03
Non-screen film rm-32-35
Non-uniformity of response rm-34-26
Normal use rm-82-04
Nuclear medicine rm-40-06
Object programmed control rm-36-44
Oblique cross grid rm-32-13
Occupancy factor rm-61-05
Occupationally exposed person..... rm-62-01
One-peak-high-voltage generator ... rm-21-02
Open-ended applicator .... rm-37-30+
Operator rm-85-02
Orientation factor rm-61-04
Orthogonal cross grid................. rm-32-12
Output image............................. rm-32-49
Output screen rm-32-48
Ovary shield............................. rm-64-07
Parallel grid rm-32-08
Particle absorption rm-12-07
Particle accelerator.................... rm-23-01
Particle fluence rm-13-02
Particle fluence rate rm-13-04
Patient rm-62-03
Patient support.......................... rm-30-02
Patient surface.......................... rm-37-18
Pendular radiotherapy rm-42-43
Penumbra rm-37-08
Percentage depth dose rm-13-52
Percentage modulation rm-36-18
Percentage ripple....................... rm-36-17
Personal dosemeter.................... rm-64-08
Phantom rm-54-01
Photon rm-11-19
Pinhole camera......................... rm-71-02
Plesioradiotherapy rm-42-22
Pointing applicator.................... rm-37-30 +
Polyenergetic gamma radiation ... rm-11-08 +
Polyenergetic radiation rm-11-08
Polyenergetic X radiation .... rm-11-08+
Preparatory state...................... rm-84-04
Primary dose monitoring system ... rm-33-03

Name of unit in the International System SI·rm-...-... •
Derived term without definition .... rm-...-... +
Term without definition .... rm-...-...—
Name of earlier unit .... rm-...-...●
Shortened term .... rm-...-...a

Primary protective shielding.........	rm-64-02
Proportional current time product	rm-36-15
Primary radiation........................	rm-11-06
Protected area	rm-63-06
Protective apron	rm-64-05 +
Protective barrier	rm-64-04
Protective clothing	rm-64-05 +
Protective device........................	rm-64-05
Protective glove	rm-44-05 +
Protective shielding....................	rm-64-01
Protective skirt..........................	rm-64-05 +
Proton	rm-11-16
Proton synchrotron.....................	rm-23-08 +
Public area	rm-63-01
Pulse amplitude analyzer window...	rm-34-23
Quality equivalent filtration.........	rm-13-45
Quality factor	rm-61-02
Rad	rm-13-08 ●
Radiation	rm-11-01
Radiation aperture	rm-37-26
Radiation beam	rm-37-05
Radiation beam axis	rm-37-06
Radiation detector	rm-51-01
Radiation detector assembly.........	rm-34-11
Radiation energy........................	rm-13-29
Radiation field............... c..	rm-37-07
Radiation hazard.........................	rm-60-01
Radiation head...........................	rm-20-06
Radiation meter	rm-50-01
Radiation protection	rm-60-02
Radiation quality..	rm-13-28
Radiation quantity	rm-13-01—
Radiation source........................	rm-20-01
Radiation source assembly	rm-20-05
Radiation source to skin distance...	rm-37-14
Radiation spectrum..	rm-13-34
Radioactive equilibrium..............	rm-12-15
Radioactive half-life	rm-13-20
Radioactive source	rm-20-02
Radioactivity	rm-12-13
Radiofrequency radiation	rm-11-01—
Radiogram.................................	rm-32-02
Radiographic cassette.................	rm-35-14
Radiographic cassette holder	rm-35-18—
Radiographic film	rm-32-32

Name of unit in the International System SI rm-...-...•
Derived term without definition .... rm-...-...+
Term without definition .... rm-...-...—
Name of earlier unit.. .... rm-...-...●
Shortened term.. rm-...-...s

Radiography paper	rm-32-37
Radiographic rating	rm-36-36
Radiography	rm-41-06
Radiological	rm-40-02
Radiological equipment..	rm-20-19
Radiological image.....................	rm-32-05
Radiological installation	rm-20-24
Radiological protection...............	rm-60-03
Radiology	rm-40-01
Radionuclide.............................	rm-11-22
Radionuclide beam therapy	rm-42-14
Radionuclide beam therapy .... equipment	rm-24-01—
Radionuclide contact therapy	rm-42-51
Radionuclide generator	rm-34-01
Radionuclide scanner.................	rm-34-04
Radionuclide source assembly.....	rm-20-05 +
Radiopharmaceutical therapy	rm-43-01
Radioscopic screen	rm-32-31
Radioscopy	rm-41-01
Radiotherapy	rm-40-05
Ready state	rm-84-05
Reconstructive tomography	rm-41-19
Reference axis	rm-37-03
Reference current time product ...	rm-36-14
Reference direction....................	rm-37-02
Reference plane	rm-37-04
Reflection target	rm-20-09
Rem	rm-13-24 ●
Residual radiation	rm-11-14
Residual X-ray tube voltage	rm-36-06
Resolving time...........................	rm-34-22
Rest energy	rm-13-31
Rest mass	rm-13-30
Roentgen	rm-13-14 ●
Rotating anode X-ray tube	rm-22-03 +
Rotation radiotherapy	rm-42-42
Scale factor	rm-34-31
Scale reading	rm-73-09
Scattered radiation.....................	rm-11-13
Scattering	rm-12-03
Scintigraphy	rm-43-02
Scintillation	rm-12-20
Screen film	rm-32-36
Scrotum shield..	rm-64-06

Name of unit in the International System SI .... rm-...-...*
Derived term without definition .... rm-...-...+
Term without definition .... rm-...-...—
Name of earlier unit .... rm-...-...●
Shortened term .... rm-...-...s

Sealed radioactive source rm-20-03
Secondary dose monitoring system rm-33-04
Secondary radiation rm-11-07
Secular equilibrium rm-12-16
Selectivity rm-32-24
Sensitive volume rm-51-07
Serial changer rm-31-04
Serial load rating rm-36-38
Serial radiography rm-41-09
Shutter rm-24-02
Sievert rm-13-24*
Significant zone of occupancy rm-63-07
Single emulsion film rm-32-33
Single load rating rm-36-37
Six-peak high-voltage generator ... rm-21-34
Slit-camera rm-71-31
Source applicator rm-25-34
Source carrier rm-24-03
Source drive mechanism rm-25-03
Specific rm-74-01
Specific activity rm-13-19
Specific plane sensitivity rm-34-24
Specified rm-74-02
Spotfilm device rm-31-05
Stand-by state rm-84-03
Standing wave linear accelerator.. rm-23-05
Star pattern camera rm-71-03
Stationary grid rm-32-14
Stationary radiotherapy rm-42-31
Step-filter rm-35-11
Stereoradiography rm-41-10
Stereoradioscopy rm-41-04
Storage-container rm-25-01
Stored energy high-voltage generator rm-21-07
Stray radiation rm-11-12
Strips per centimetre rm-32-16
Structural shielding rm-64-03
Superficial radiotherapy rm-42-01
Superimposed focal spots rm-22-09
Surface dose rm-13-50
Synchrotron rm-23-08

Tangential radiotherapy .... rm-42-32 +
Tapered grid rm-32-10
Target rm-20-08
Target angle rm-20-11
Target volume rm-37-20
Teleradiotherapy rm-42-23
Tenth-value layer rm-13-43
Test device rm-71-04
Therapeutic beam applicator .... rm-37-30 +
Thermionic emission rm-12-21
Thermoluminescence rm-12-19
Thoraeus filter rm-35-04
Timing device rm-83-03
Tissue equivalent material rm-35-16
Tomograph .... rm-31-01 +
Tomography rm-41-15
Total filtration rm-13-48
Transfer rm-84-02
Transmission rm-12-10
Transmission chamber rm-51-04
Transmission of primary radiation rm-32-21
Transmission of scattered radiation rm-32-23
Transmission of total radiation ... rm-32-22
Transmission ratio rm-13-41
Transmission target rm-20-10
Travelling wave linear accelerator rm-23-04
Treatment control panel rm-33-03
Treatment room rm-20-23
Treatment volume rm-37-21
True count rate rm-34-20
True value rm-73-07
Twelve-peak high-voltage generator rm-21-05
Two-peak high-voltage generator.. rm-21-03

Ultraviolet radiation .... rm-11-01 —
Unmonitorable public area rm-63-03
Unsealed radioactive source rm-20-04
Useful object field size rm-37-10
User rm-85-01

Van de graaff generator rm-21-12
Virtual source rm-37-01
Visible radiation .... rm-11-01 —

Water kerma rm-13-12
Wedge filter rm-35-10
Whole body radiotherapy rm-42-03
Workload rm-61-03

X-irradiation .... rm-12-09 +
X-radiation .... rm-11-01 —
X-ray beam .... rm-37-05 +
X-ray beam axis .... rm-37-06 +

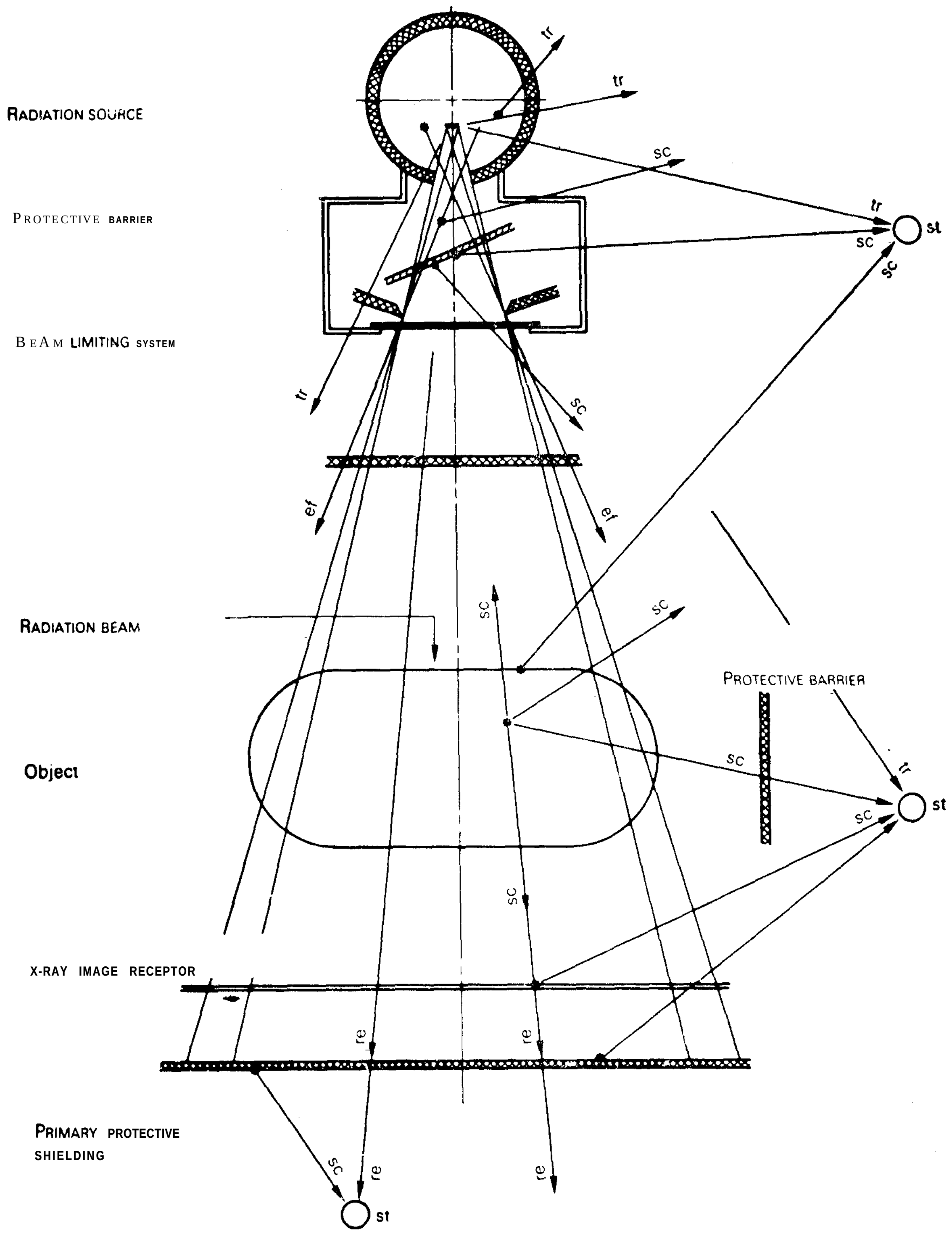
Name of unit in the International System SI rm-...-...*
Derived term without definition .... rm-...-...+
Term without definition .... rm-...-...—
Name of earlier unit .... rm-...-...●
Shortened term .... rm-...-...s

X-ray equipment rm-20-20
X-ray field .... rm-37-07+
X-ray generator rm-20-17
X-ray image intensifier rm-32-39
X-ray image intensifier tube rm-32-41
X-ray image receptor rm-32-29
X-ray imaging arrangement rm-20-2 1
X-ray installation .... rm-20-24+
X-ray pattern rm-32-O 1
X-ray source assembly .... rm-20-05 +
X-ray spectrum .... rm-13-34+
X-ray television system rm-32-50
X-ray therapy rm-42- 12

Name of unit in the International System SI rm-...-...*
Derived term without definition .... rm-...-...- +
Term without definition .... rm-. .-. . . —
Name of earlier unit .... rm-...-...a
Shortened term .... rm-...-.. s

X-ray tube .... rm-?2-03
X-ray tube assembly rm-22-0 1
X-ray tube assembly cooling curve rm-36-33
X-ray tube assembly heat content rm-36-30
X-ray tube assembly heating curve rm-36-32
X-ray tube assembly input power rm-36-25
X-ray tube current rm-36-07
X-ray tube head rm-20-07
X-ray tube housing rm-22-02
X-ray tube load rm-36-21
X-ray tube voltage rm-36-02
Zero filter rm-35-06
Zonography rm-41-17

ENGLISH TER-MS NOT TO BE USED		TERMS TO BE CONSIDERED INSTEAD
Anode heat capacity	rm-36-27	Maximum anode heat content
Axis of the beam........................	rm-37-06	Radiation beam axis
Back scatter	rm-11-13	Scattered radiation
Back scatter..............................	rm-12-04	Back-scattering
Beam axis	rm-37-06	Radiation beam axis
Central axis of the beam	rm-37-03	Reference axis
Central axis of the beam	rm-37-06	Radiation beam axis
Central ray	rm-37-03	Reference axis
Central ray	rm-37-06	Radiation beam axis
Cinelluorography........................	rm-41-14	Cineradiography
Collimator, other than in nuclear medicine	rm-37-28	Beam limiting device
Dental cone	rm-37-30 +	Beam applicator, Dental#
Entrance dose	rm-13-50	Surface dose
Exposure (of an object)	rm- 12-09	Irradiation
Exposure (of an X-ray tube)	rm-36-09	Loading
Exposure switch	rm-30-03	Irradiation switch
Exposure time (to electric supply)	rm-36-10	Loading time
Exposure time (to radiation)	rm-36-11	Irradiation time
Focus	rm-20- 13s	Focal spot
Gamma ray	rm-11-01	Gamma radiation
Half-value thickness	rm- 13-42	Half-value layer
Maximum potential difference......	rm-36-03	Nominal X-ray tube voltage
Multified radiotherapy	rm-42-32	Cross fire radiotherapy
Pointer cone	rm-37-30 +	Pointing applicator
Radiograph	rm-32-02	Radiogram
Reading	rm-37-09	Scale reading
Receptive area...........................	rm-37-16	Image reception area
Scatter	rm-11-13	Scattered radiation
Scattered ray grid	rm-32-06	Anti-scatter grid
Specified direction.....................	rm-37-02	Reference direction
Spectrum	rm-13-34	Radiation spectrum
Technique factor........................	rm-36-0 1	Loading factor
Telegamma therapy equipment......	rm-24-01 +	Gamma beam therapy equipment
Tenth-value thickness..................	rm- 13-43	Tenth-value layer
Use factor.................................	rm-61-04	Orientation factor
Useful beam	rm-37-05	Radiation beam
X-ray	rm-1 l-01-	X-radiation
X-ray tube assembly heat capacity	rm-36-3 1	Maximum X-ray tube assembly heat content
X-ray tube potential difference......	rm-36-02	X-ray tube voltage



ef = EXTRA-FOCAL RADIATION
re = RESIDUAL RADIATION
sc = SCATTERED RADIATION
st = STRAY RADIATION
tr = LEAKAGE RADIATION (TRANSIT RADIATION)

FIG. 1 IONIZING RADIATION

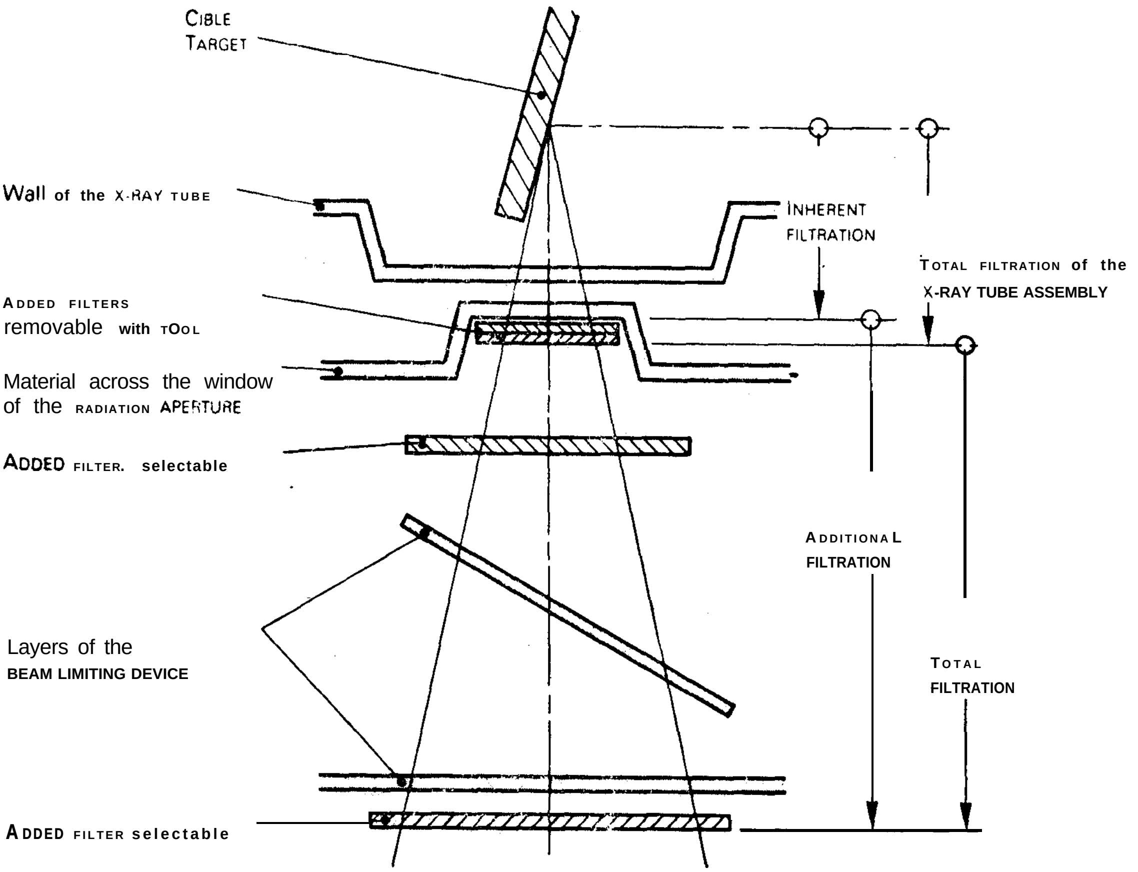

CIBLE
TARGET
Wall of the X-RAY TUBE
INHERENT FILTRATION
TOTAL FILTRATION of the X-RAY TUBE ASSEMBLY
ADDED FILTERS removable with TOOL
Material across the window of the RADIATION APERTURE
ADDED FILTER, selectable
ADDITIONAL FILTRATION
Layers of the BEAM LIMITING DEVICE
TOTAL FILTRATION
ADDED FILTER selectable

FIG. 2 FILTERING MATERIALS OF THE X-RAY SOURCE ASSEMBLY

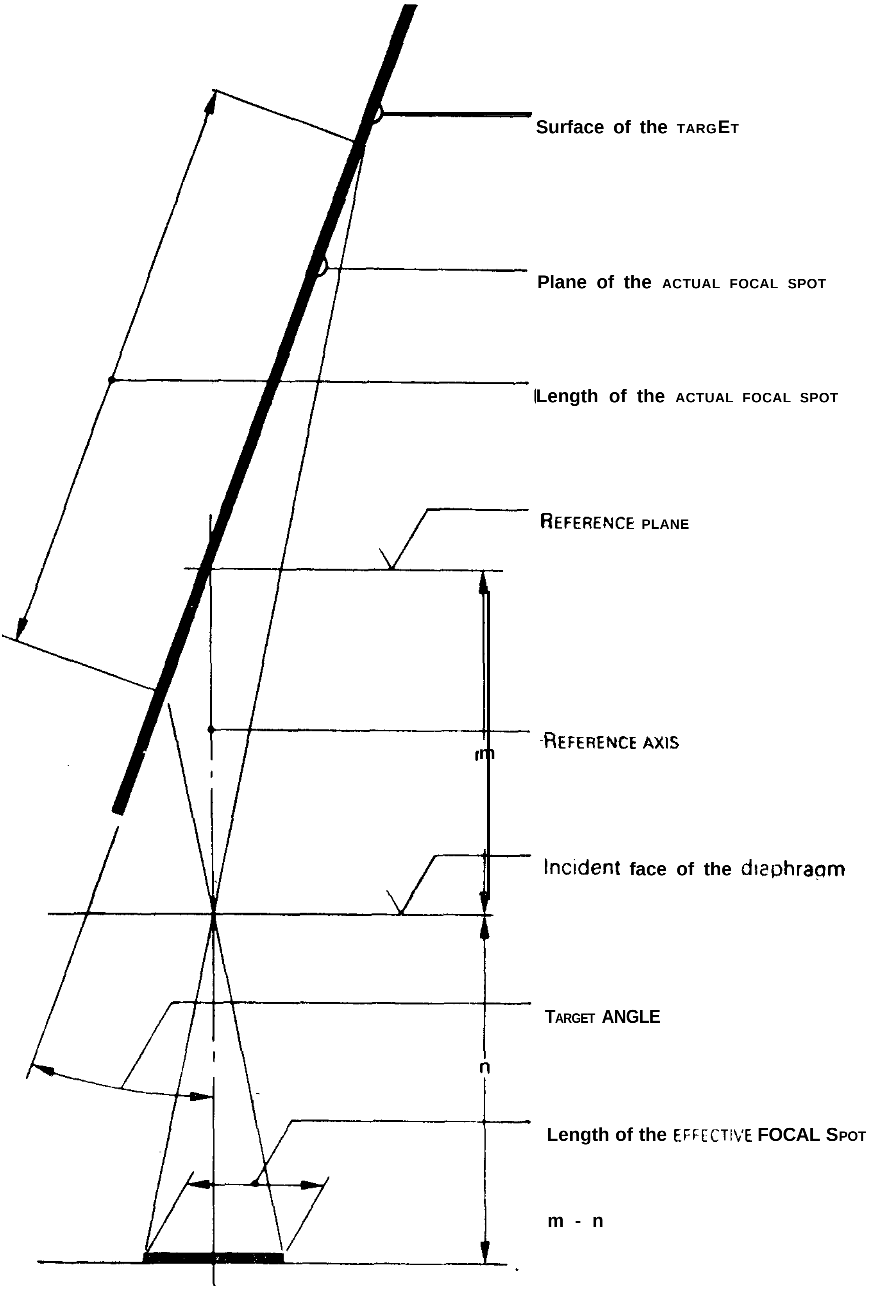

Surface of the TARGET
Plane of the ACTUAL FOCAL SPOT
Length of the ACTUAL FOCAL SPOT
REFERENCE PLANE
REFERENCE AXIS
m
Incident face of the diaphragm
TARGET ANGLE
n
Length of the EFFECTIVE FOCAL SPOT
m - n

FIG. 3 GEOMETRY OF THE FOCAL SPOT

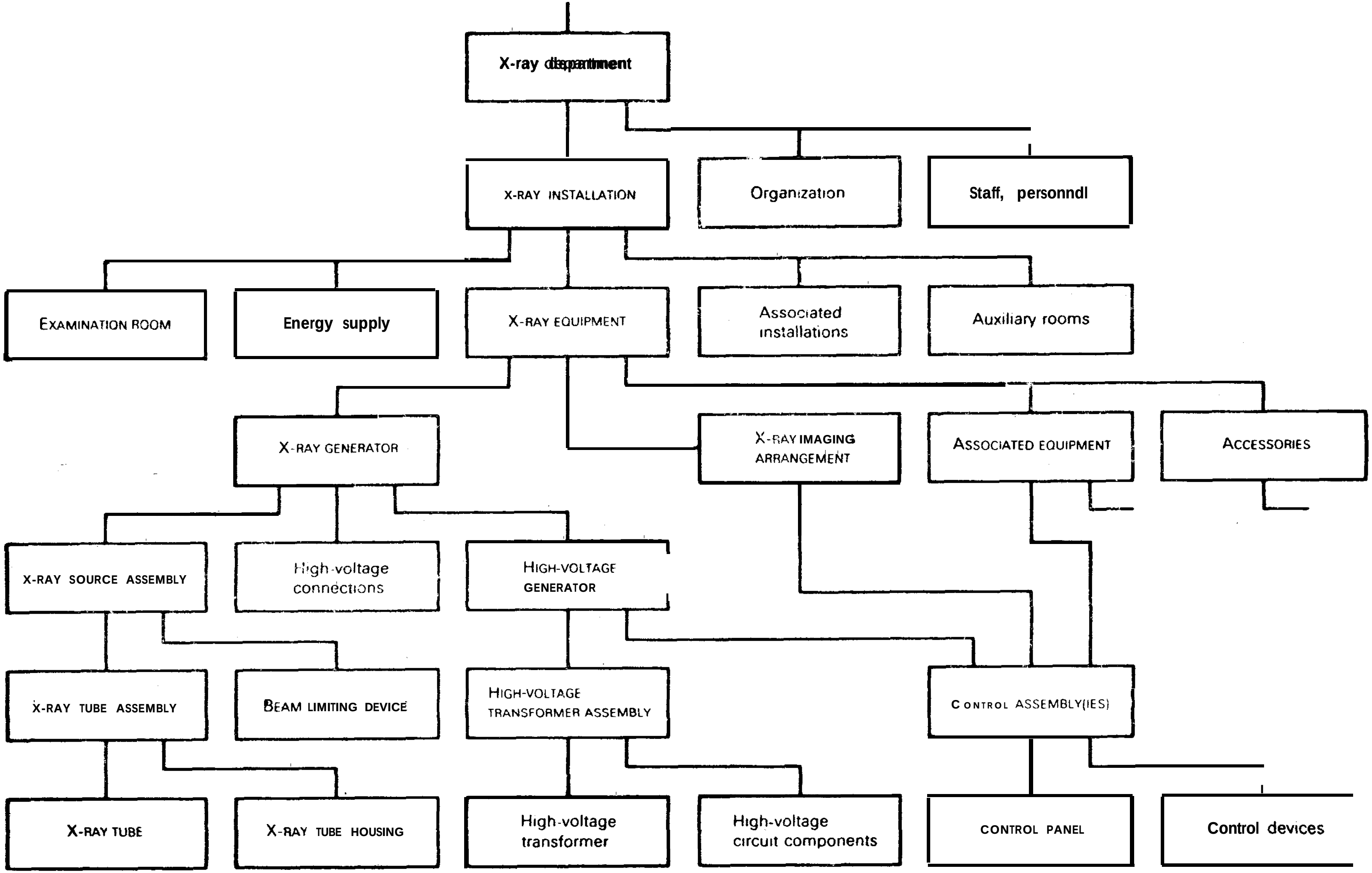


FIG. 4 THE COMPONENTS OF AN X-RAY EQUIPMENT

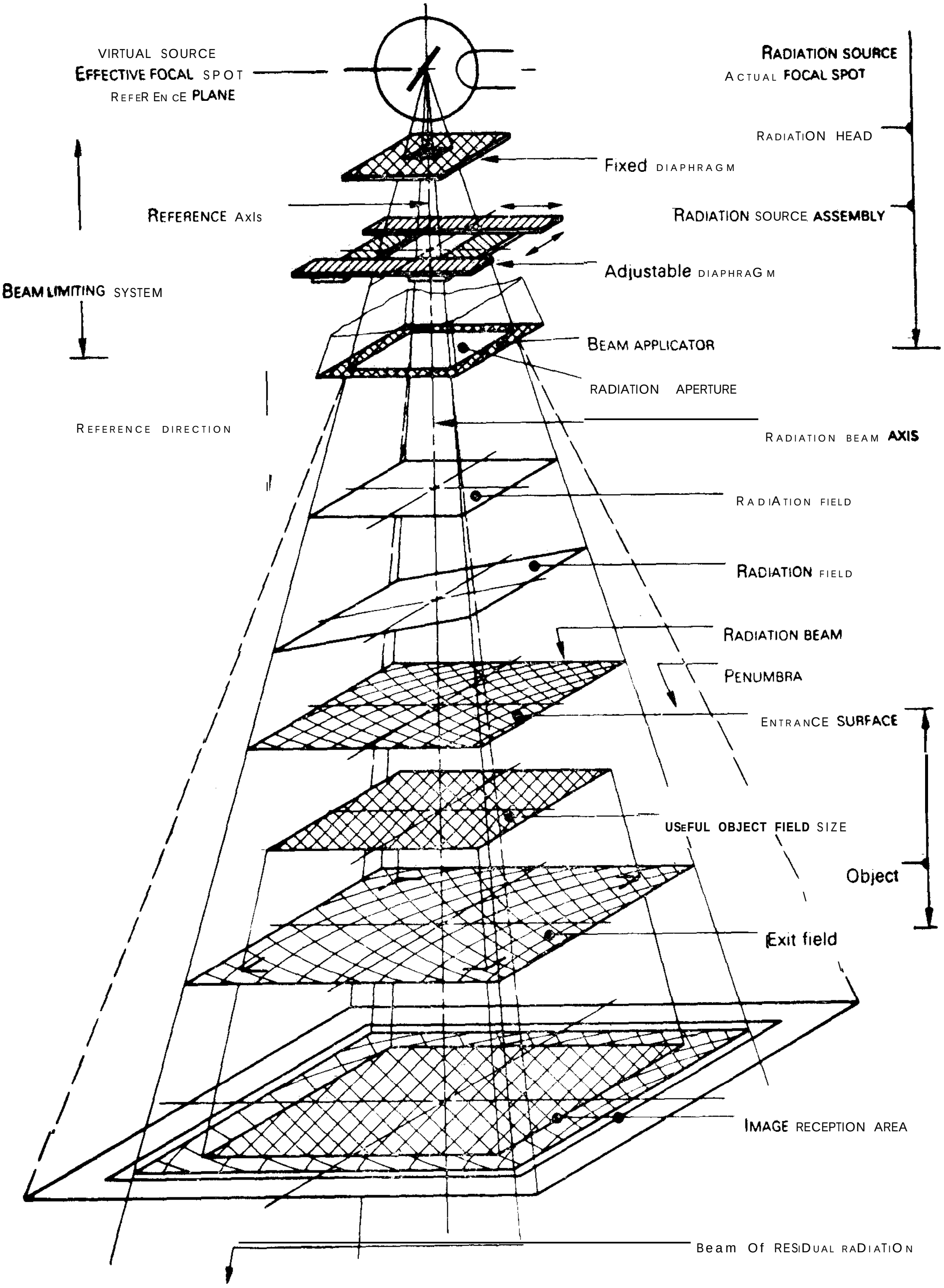


FIG. 5 GEOMETRY OF THE RADIATION BEAM

NATIONAL EXPLANATORY NOTE

This Terminology Standard contains a compilation of terms and definitions as used or to be used in safety and performance standards dealing with electrical equipment in medical practice.

All concepts are concerned with medical radiology, most of them restricted to physical and technical subjects of a nature specific to medical radiology.

Some concepts of a more general nature have been assembled in Sections 7 and 8 and might disappear from a future revised edition of this Teminology Standard on medical radiology when a more comprehensive Terminology Standard for medical electrical equipment containing these concepts becomes available.

In this Terminology Standard, where a definition starts with words such as: "In radiotherapy,..." (rm-37-20) or "For a linear grid,......" (rm-32-17), it is recognized that the same term might be applied in another context to a different concept. That means that in some case:;, it may be necessary to include an appropriate qualifier into the term or to use it with another identification. Purely medical terms and physical or technical concepts with a more general application have been excluded, as for such concepts, reference to medical, physical and technical handbooks or vocabularies should bc made. However, for some of such physical and technical concepts, the terms are given to ensure the consistent use of corresponding terms in English language. Such terms (without definition) are identified by a minus sign after their number.

Likewise, only the terms in English language are given, where the terms arc derived from a defined basic term by addition of an unambiguous qualification.

As far as possible, for the purpose of this Terminology Standard, terms and definitions contained in existing publications of ICRU, ICRP, ISO and IEC have been adopted. In particular, the following publications have been used:

ICRU Report 33,

IS0 Standard 921 : Nuclear Energy Glossary,

IEC Publication 50 (391): International Electrotechnical Vocabulary (IEV), Chapter 391: Detection and Measurement of Ionizing Radiation by Electric Means.

In a restricted number of cases, new terms have been adopted which may express the intended concept more clearly and which may, by deprecation of some existing terms and by new structures of interdepending concepts, avoid serious misinterpretation of the requirements and other misunderstandings.

Some terms which have been commonly used in the past and which are deprecated for the said reasons are listed at the end of the alphabetical index (p 33), giving reference to the terms and concepts to be used instead.

Throughout this Terminology Standard, synonyms have been avoided as they may constitute possible sources of confusion.

Only in a few rare cases, where the full term would impede the flow of the language out of proportion and where no misinterpretation is possible, shortened terms are recognized and contained in the alphabetical indices.

Generally, the relation between terms of interdependent concepts follows a number of logical schemes. However, in some cases, compromises had to be found where the use of certain terms appeared obligatory because of tradition.

In some sections, a sub-section titled 'General' combines the concepts commonly applying to more than one of its sub-sections.

Wherever applicable for quantities and related quantitative concepts, the strict use of SI units is presumed when referring to this Terminology Standard.

This Terminology Standard does not claim to be exhaustive with respect to the concepts needed for Various aspects of standardization of radiological equipment and related aspects. Supplements will be published in due course of time.

Bureau of Indian Standards

BIS is a statutory institution established under the Bureau of *Indian* Standards Act, *1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course-of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Revision of Indian Standards

Indian Standards are reviewed periodically and revised, when necessary **and amendments, if any, are issued from time to time.** Users of **Indian Standards should ascertain that** they are in possession of the latest amendments or edition. Comments on this Indian Standard may be sent to **BIS** giving the following reference

This Indian Standard has been developed from Doc. **No, MHD 19 (2402)**

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters :
Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices : **Telephone**

Central : Manak Bhavan, 9 Bahadur **Shah Zafar Marg**
NEW DELHI 110002 — **331 01 31**, **331 1375**

Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktols
CALCUTTA 700054 — 3784 85 61, 37 86 99,26,37 37 86 62

Northern : **SCO** 335-336, Sector 34-A, **CHANDIGARH** 160022 — 38, 60 60 20 43 25

Southern : **C.** I.T. Campus, IV Cross Road, MADRAS 600113 — 235 15 19, 235 23 15 235 02 16,235 04 42

Western : Manakalaya, E9 MIDC, Marol, Andheri (East)
BOMBAY 400093 — 632 92 95,632 78 58, 632 78 91,632 78 92

Branches : AHMADABAD. BANGALORE. BHOPAL. BHUBANESHWAR. **COIMBATORE.** FARIDABAD, GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. **LUCKNOW.** PATNA. THIRUVANANTHAPURAM.

Printed at Simco Printing Press, Delhi, India